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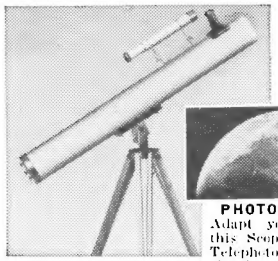

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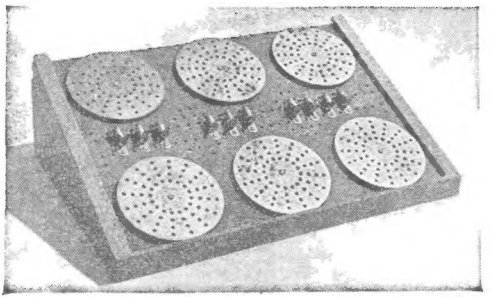

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"WE NEED A HEURISTIC..."

WAS up at M.I.T. a week or so ago, talking with Claude Shannon and some of his group about the problem of getting a computer to play chess . . . and for the first time I began to understand the fundamental difference between the engineering approach to problems, and the scientific approach.

Big computers have been programmed to play chess; it's been done, and they can play a moderately good game —more than enough to satisfy a rank amateur, adequate for the average grade chess player—but there are limitations that make the computers play a kind of game entirely different from that usually visualized as the style of a chess-playing machine.

Theoretically, a computer could play perfect chess; chess constitutes a known Universe, in which *all* the laws are known with absolute certainty. (By definition!) The game is inherently logical: in perfect chess there is no random element whatever. (Imperfect players introduce random factors, of course, but a logic machine would play perfect chess.)

There is, however, one slight catch to this. Shannon's group called it to my attention in this way: Suppose the board situation is such that a white knight is protecting a pawn against capture by the black king, and also blocking white's bishop from the black king. Moving the knight will check black's king—and the black king will take white's pawn to get off the checked square.

A human player observes this situation, and, in effect, says "If I move the knight, black's king is checked, and he'll take my pawn."

A logical machine doesn't work that way. It spends time determining "If the knight is moved to square 24, the king is in check. Black king takes pawn. Move undesirable. If the knight moves to square 32, black king

is checked by white bishop. Black king takes pawn. Move undesirable. If the knight moves to square . . ." and so on, patiently exploring every possible knight move, one at a time. Each exploration requires considering at least two moves in the future. The amount of data-shifting, memory-bank consultation, evaluation-rules consultation, et cetera, involved in these considerations is sufficiently massive that even the enormously high-speed operation of an electronic computer gets bogged down in sheer data-manipulation.

How do you tell a computer, "If you find that moving the knight *away* is undesirable, do not consider moving the knight away *anywhere*," and do it in such a way that it isn't absolutely ruled out? (The loss of the pawn might involve such a position that black would, four moves later, inevitably lose his queen.)

A computer is *logical*. Rules have *no* exceptions whatever. There are *no* random factors. A logical machine plays chess on an *algorithmic* basis, in the mathematical sense of the term. An algorithm is a process which is absolutely certain to work every time, without any exceptions whatever. In contrast, a heuristic method works brilliantly . . . sometimes.

A simple example; we all learned the algorithm for dividing a large number by a smaller number, known to us as "long division." It's an algorithm because it *always* works for *any* two numbers.

We also learned a heuristic method: "Shift the decimal point one place to the left." That method works brilliantly, with extreme simplicity and speed . . . provided the divisor happens to be 10. It does not, of course, work for any other number. But most of us have a lot of pet heuristics that we've developed over the years. Personally, I find doubling the number and then shifting the decimal point an easier mental operation than dividing by 5, for instance. Three items, each costing 97¢, is, for me, (3 x 100)—(3 x 3), instead of 3 x 97 direct. In this case, the process used is basically an algorithm—but selecting when to use it is an heuristic. After all, you can say that 3 x 76 is (3 x 100)—(3 x 24) . . . it's just that there's no gain in that "short" cut.

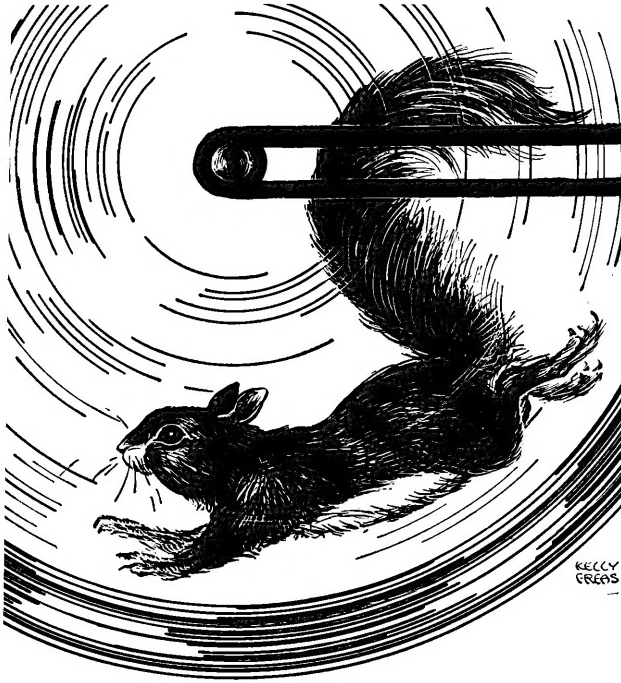
The human chess player would use a heuristic method of solving the problem of the knight's move; he'd recognize that *any* move of the knight would produce the situation K x P, and drop consideration of the possibility of moving the knight right there.

It occurred to me that, in essence, Science consists of physical-world algorithms—methods that *always* work, methods that you can be *certain* of. And engineering, in contrast, is primarily heuristic. Science "plays" the Universe like a computer playing chess; just give it time enough, and it'll work out all the possible variations, study all the possible moves, and come to an inevitably certain correct answer.

(*Continued on page* 159)

BUT, I DON'T THINK

BY RANDALL GARRETT



As every thinking man knows, every slave always yearns for the freedom his master denies him . . .

Illustrated by Freas

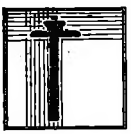
"But, gentlemen," said the Physician, "I really don't think we can consider any religion which has human sacrifice as an integral part as a humane religion."

"At least," added the Painter with a chuckle, "not as far as the victim is concerned."

The Philosopher looked irritated. "Bosh! What if the victim likes *it that way?"*

—THE IDLE WORSHIPERS
by R. Phillip Dachboden

I



THE great merchantship *Naipor* settled her tens of thousands of tons of mass into her landing cradle on Viornis as gently as an egg being settled into an egg crate, and almost as silently. Then, as the antigravs were cut off, there was a vast, metallic sighing as the gigantic structure of the cradle itself took over the load of holding the ship in her hydraulic bath.

At that point, the ship was officially groundside, and the *Naipor* was in the hands of the ground officers. Space Captain Humbolt Reed sighed, leaned back in his desk chair, reached out a hand, and casually touched a trio of sensitized spots on the surface of his desk.

"Have High Lieutenant Blyke bring The Guesser to my office immediately," he said, in a voice that was obviously accustomed to giving orders that would be obeyed.

Then he took his fingers off the spots without waiting for an answer.

In another part of the ship, in his quarters near the Fire Control Section, sat the man known as The Guesser. He had a name, of course, a regular name, like everyone else; it was down on the ship's books and in the Main Registry. But he almost never used it; he hardly ever even thought of it. For twenty of his thirty-five years of life, he had been a trained Guesser, and for fifteen of them he'd been The Guesser of *Naipor*.

He was fairly imposing-looking for a Guesser; he had the tall, wide-shouldered build and the blocky face of an Executive, and his father had been worried that he wouldn't show the capabilities of a Guesser, while his mother had secretly hoped that he might actually become an Executive. Fortunately for The Guesser, they had both been wrong.

He was not only a Guesser, but a first-class predictor, and he showed impatience with those of his underlings who failed to use their ability in any particular. At the moment of the ship's landing, he was engaged in verbally burning the ears off Kraybo, the young man who would presumably take over The Guesser's job one day—if he ever learned how to handle it.

"You're either a liar or an idiot," said The Guesser harshly, "and I wish to eternity I knew which!"

Kraybo, standing at attention, merely swallowed and said nothing. He had felt the back of The Guesser's hand too often before to expose

himself intentionally to its swing again.

The Guesser narrowed his eyes and tried to see what was going on in Kraybo's mind.

"Look here, Kraybo," he said after a moment, "that one single Misfit ship got close enough to do us some damage. It has endangered the life of the *Naipor* and the lives of her crewmen. You were on the board in that quadrant of the ship, and you let it get in too close. The records show that you mis-aimed one of your blasts. Now, what I want to know is this: were you really guessing or were you following the computer too closely?"

"I was following the computer," said Kraybo, in a slightly wavering voice. "I'm sorry for the error, sir; it won't happen again."

The Guesser's voice almost became a snarl. "It hadn't better! You know that a computer is only to feed you data and estimate probabilities on the courses of attacking ships; you're not supposed to think they can predict!"

"I know, sir; I just—"

"You just near came getting us all killed!" snapped The Guesser. "You claim that you actually guessed where that ship was going to be, but you followed the computer's extrapolation instead?"

"Yes, sir," said the tense-faced Kraybo. "I admit my error, and I'm willing to take my punishment."

The Guesser grinned wolfishly. "Well, isn't that big-hearted of you? I'm very glad you're willing, because I just don't know what I'd do if you refused."

Kraybo's face burned crimson, but he said nothing.

The Guesser's voice was sarcastically soft. "But I guess about the only thing I could do in that case would be to"—The Guesser's voice suddenly became a bellow—*"kick your thick head in!"*

Kraybo's face drained of color suddenly.

The Guesser became suddenly brusque. "Never mind. We'll let it go for now. Report to the Discipline Master in Intensity Five for ten minutes total application time. Dismissed."

Kraybo, whose face had become even whiter, paused for a moment, as though he were going to plead with The Guesser. But he saw the look in his superior's eyes and thought better of it.

"Yes, sir," he said in a weak voice. He saluted and left.

And The Guesser just sat there, waiting for what he knew would come.

It did. High Lieutenant Blyke showed up within two minutes after Kraybo had left. He stood at the door of The Guesser's cubicle, accompanied by a sergeant-at-arms.

"Master Guesser, you will come with us." His manner was bored and somewhat flat.

The Guesser bowed his head as he saluted. "As you command, great sir." And he followed the lieutenant into the corridor, the sergeant tagging along behind.

The Guesser wasn't thinking of his

own forthcoming session with the captain; he was thinking of Kraybo.

Kraybo was twenty-one, and had been in training as a Guesser ever since he was old enough to speak and understand. He showed occasional flashes of tremendous ability, but most of the time he seemed—well, *lazy*. And then, there was always the question of his actual ability.

A battle in the weirdly distorted space of ultralight velocities requires more than machines and more than merely ordinary human abilities. No computer, however built, can possibly estimate the flight of a dodging spaceship with a canny human being at the controls. Even the superfast beams from a megadyne force gun require a finite time to reach their target, and it is necessary to fire at the place where the attacking ship will be, not at the position it is occupying at the time of firing. That was a bit of knowledge as old as human warfare: you must lead a moving target.

For a target moving at a constant velocity, or a constant acceleration, or in any other kind of orbit which is mathematically predictable, a computer was not only necessary, but sufficient. In such a case, the accuracy was perfect, the hits one hundred per cent.

But the evasive action taken by a human pilot, aided by a randomity selector, is not logical and therefore cannot be handled by a computer. Like the path of a microscopic particle in Brownian motion, its position can only be predicted statistically; estimating its probable location is the best that can be done. And, in space warfare, probability of that order is simply not good enough.

To compute such an orbit required a special type of human mind, and therefore a special type of human. It required a Guesser.

The way a Guesser's mind operated could only be explained *to* a Guesser *by* another Guesser. But, as far as anyone else was concerned, only the objective results were important. A Guesser could "guess" the route of a moving ship, and that was all anyone cared about. And a Master Guesser prided himself on his ability to guess accurately 99.999% of the time. The ancient sport of baseball was merely a test of muscular co-ordination for a Guesser; as soon as a Guesser child learned to control a bat, his batting average shot up to 1.000 and stayed there until he got too old to swing the bat. A Master Guesser could make the same score blindfolded.

Hitting a ship in space at ultralight velocities was something else again. Young Kraybo could play baseball blindfolded, but he wasn't yet capable of making the master guesses that would protect a merchantship like the *Naipor*.

But what was the matter with him? He had, of course, a fire-control computer to help him swing and aim his guns, but he didn't seem to be able to depend on his guesswork. He had more than once fired at a spot where the computer said the ship would be instead of firing at the spot where it

actually arrived a fraction of a second later.

There were only two things that could be troubling him. Either he was doing exactly as he said—ignoring his guesses and following the computer—or else he was inherently incapable of controlling his guesswork and was hoping that the computer would do the work for him.

If the first were true, then Kraybo was a fool; if the second, then he was a liar, and was no more capable of handling the fire control of the *Naipor* than the captain was.

The Guesser hated to have Kraybo punished, really, but that was the only way to make a youngster keep his mind on his business.

After all, thought The Guesser, *that's the way I learned; Kraybo can learn the same way. A little nerve-burning never hurt anyone.*

But that last thought was more to bolster himself than it was to justify his own actions toward Kraybo. The lieutenant was at the door of the captain's office, with The Guesser right behind him.

The door dilated to receive the three—the lieutenant, The Guesser, and the sergeant-at-arms—and they marched across the room to the captain's desk.

The captain didn't even bother to look up until High Lieutenant Blyke saluted and said: "The Guesser, sir."

And the captain gave the lieutenant a quick nod and then looked coldly at The Guesser. "The ship has been badly damaged. Since there are no repair docks here on Viornis, we will have to unload our cargo and then go —*empty*—all the way to D'Graski's Planet for repairs. All during that time, we will be more vulnerable than ever to Misfit raids."

His ice-chill voice stopped, and he simply looked at The Guesser with glacier-blue, unblinking eyes for ten long seconds.

The Guesser said nothing. There was nothing he *could* say. Nothing that would do him any good.

The Guesser disliked Grand Captain Reed—and more, feared him. Reed had been captain of the *Naipor* for only three years, having replaced the old captain on his retirement. He was a strict disciplinarian, and had a tendency to punish heavily for very minor infractions of the rules. Not, of course, that he didn't have every right to do so; he was, after all, the captain.

But the old captain hadn't given The Guesser a nerve-burning in all the years since he had accepted The Guesser as The Guesser. And Captain Reed—

The captain's cold voice interrupted his thoughts.

"Well? What was it? If it was a mechano-electronic misfunction of the computer, say so; we'll speak to the engineer."

The Guesser knew that the captain was giving him what looked like an out—but The Guesser also knew it was a test, a trap.

The Guesser bowed his head very low and saluted. "No, great sir; the fault was mine."

Grand Captain Reed nodded his head in satisfaction. "Very well. Intensity Five, two minutes. Dismissed."

The Guesser bowed his head and saluted, then he turned and walked out the door. The sergeant-at-arms didn't need to follow him; he had been let off very lightly.

He marched off toward the Disciplinary Room with his head at the proper angle—ready to lift it if he met a lesser crewman, ready to lower it if he met an executive officer.

He could already feel the terrible pain of the nerve-burner coursing through his body—a jolt every ten seconds for two minutes, like a whip lashing all over his body at once. His only satisfaction was the knowledge that he had sentenced Kraybo to ten minutes of the same thing.

The Guesser lay on his bed, face down, his grasping fingers clutching spasmodically at the covering as his nerves twitched with remembered pain. Thirteen jolts. Thirteen searing jolts of excruciating torture. It was over now, but his synapses were still crackling with the memories of those burning lashes of energy.

He was thirty-five. He had to keep that in mind. He was thirty-five now, and his nerves should be under better control than they had been at twenty. He wondered if there were tears streaming from his eyes, and then decided it didn't matter. At least he wasn't crying aloud.

Of course, he had screamed in the nerve-burner; he had screamed thirteen times. Any man who didn't scream when those blinding stabs of pain came was either unconscious or dead—it was no disgrace to scream in the burner. But he wasn't screaming now.

He lay there for ten minutes, his jaw clamped, while the twitching subsided and his nervous system regained its usual co-ordination.

The burner did no actual physical damage; it wasn't good economics for an Executive to allow his men to be hurt in any physical manner. It took a very little actual amount of energy applied to the nerve endings to make them undergo the complex electrochemical reaction that made them send those screaming messages to the brain and spine. There was less total damage done to the nerves than a good all-night binge would do to a normal human being. But the effect on the mind was something else again.

It was a very effective method of making a man learn almost any lesson you wanted to teach him.

After a while, The Guesser shuddered once more, took a deep breath, held it for fifteen seconds, and then released it. A little later, he lifted himself up and swung his legs over the edge of his bed. He sat on the edge of the bed for a few minutes, then got up and got dressed in his best uniform.

After all, the captain hadn't said anything about restricting him to the ship, and he had never been to Viornis before. Besides, a couple of drinks might make him feel better.

There were better planets in the galaxy, he decided two hours later. Thousands of them.

For one thing, it was a small, but dense world, with a surface gravity of one point two standard gees not enough to be disabling, but enough to make a man feel sluggish. For another, its main export was farm products; there were very few large towns on Viornis, and no center of population that could really be called a city. Even here, at the spaceport, the busiest and largest town on the planet, the population was less than a million. It was a "new" world, with a history that didn't stretch back more than two centuries. With the careful population control exercised by the ruling Execs, it would probably remain small and provincial for another half millennium.

The Guesser moseyed down one of the streets of Bellinberg —probably named after the first Prime Executive of the planet—looking for a decent place for a spaceman to have a drink. It was evening, and the sinking of the yellow primary below the western horizon had left behind it a clear, star-filled sky that filled the air with a soft, white radiance. The streets of the town itself were well-lit by bright glow-plates imbedded in the walls of the buildings, but above the street level, the buildings themselves loomed darkly. Occasionally, an Exec's aircar would

drift rapidly overhead with a soft rush of air, and, in the distance, he could see the shimmering towers of the Executive section rising high above the eight- or ten-storyed buildings that made up the majority of Bellinberg.

The streets were fairly crowded with strollers—most of them Class Four or Five citizens who stepped deferentially aside as soon as they saw his uniform, and kept their eyes averted from him. Now and then, the power car of a Class Three rolled swiftly by, and The Guesser felt a slight twinge of envy. Technically, his own rank was the equivalent of Class Three, but he had never owned a groundcar. What need had a spaceman of a groundcar? Still, it would be nice to drive one just once, he thought; it would be a new experience, certainly.

Right now, though, he was looking for a Class Three bar; just a place to have a small, quiet drink and a bite to eat. He had a perfect right to go into a lower class bar, of course, but he had never felt quite comfortable associating with his inferiors in such a manner, and certainly they would feel nervous in his presence because of the sidearm at his hip.

No one below Class Three was allowed to carry a beamgun, and only Ones and Twos were allowed to wear the screening fields that protected them from the nerve-searing effects of the weapon. And they, being Execs, were in no danger from each other.

Finally, after much walking, he decided that he was in the wrong part of town. There were no Class Three bars anywhere along these streets. Perhaps, he thought, he should have gone to the Spacemen's Club at the spaceport itself. On the other hand, he hadn't particularly wanted to see any of the other minor officers of his own class after the near-fiasco which had damaged the *Naipor*. Being a Guesser set him apart, even from other Threes.

He thought for a moment of asking a policeman, but he dismissed it. Cops, as always, were a breed apart. Besides, they weren't on the streets to give directions, but to preserve order.

At last, he went into a nearby Class Four bar and snapped his fingers for the bartender, ignoring the sudden silence that had followed his entrance.

The barman set down a glass quickly and hurried over, bobbing his head obsequiously. "Yes, sir; yes, sir. What can I do for you, sir? It's an honor to have you here, sir. How may I serve you?"

The man himself was wearing the distinctive clothing of a Five, so his customers outranked him, but the brassard on his arm showed that his master was a Two, which afforded him enough authority to keep reasonable order in the place.

"Where's the nearest Class Three bar?" The Guesser snapped.

The barman looked faintly disappointed, but he didn't lose his obsequiousness. "Oh, that's quite a way

from here, sir—about the closest would be Mallard's, over on Fourteenth Street and Upper Drive. A mile, at least."

The Guesser scowled. He was in the wrong section of town, all right.

"But I'd be honored to serve you, sir," the barman hurried on. "Private booth, best of everything, perfect privacy—"

The Guesser shook his head quickly. "No. Just tell me how to get to Mallard's."

The barman looked at him for a moment, rubbing a fingertip across his chin, then he said: "You're not driving, I suppose, sir? No? Well, then, you can either take the tubeway or walk, sir . . ." He let the sentence hang, waiting for The Guesser's decision.

The Guesser thought rapidly. Tubeways were for Fours and Fives. Threes had groundcars; Ones and Twos had aircars; Sixes and below walked. And spacemen walked.

Trouble is, spacemen aren't used to walking, especially on a planet where they weigh twenty per cent more than they're used to. The Guesser decided he'd take the tubeway; at the Class Three bar, he might be able to talk someone into driving him to the spaceport later.

But five minutes later, he was walking in the direction the bartender had told him to take for finding Mallard's on foot. To get to the tubeway was a four-block walk, and then there would be another long walk after he got off. Hoofing it straight there would be only a matter of five blocks difference, and it would at least spare him the embarrassment of taking the tube.

It was a foolish thing to do, perhaps, but once The Guesser had set his mind on something, it took a lot more than a long walk to dissuade him from his purpose. He saw he was not the only spaceman out on the town; one of the Class Five taverns he passed was filled with boisterous singing, and he could see a crowd of men standing around three crewmen who were leading them in a distinctly off-color ballad. The Guesser smiled a little to himself. Let them have their fun while they were on-planet; their lives weren't exactly bright aboard ship.

Of course, they got as much as was good for them in the way of entertainment, but a little binge gave them something to look forward to, and a good nerve-burning would sober them up fast enough if they made the mistake of coming back drunk.

Nerve-burning didn't really bother a Five much, after all; they were big, tough, work-hardened clods, whose minds and brains simply didn't have the sensitivity to be hurt by that sort of treatment. Oh, they screamed as loud as anyone when they were in the burner, but it really didn't have much effect on them. They were just too thick-skulled to have it make much difference to them one way or the other.

On the other hand, an Exec would probably go all to pieces in a

burner. If it didn't kill him outright, he'd at least be sick for days. They were too soft to take even a touch of it. No Class One, so far as The Guesser knew, had ever been subjected to that sort of treatment, and a Two only got it rarely. They just weren't used to it; they wouldn't have the stamina to take it.

His thoughts were interrupted suddenly by the familiar warning that rang in his mind like a bell. He realized suddenly, as he became blazingly aware of his surroundings, that he had somehow wandered into a definitely low-class neighborhood. Around him were the stark, plain housing groups of Class Six families. The streets were more dimly lit, and there was almost no one on the street, since it was after curfew time for Sixes. The nearest pedestrian was a block off and moving away.

All that took him but a fraction of a second to notice, and he knew that it was not his surroundings which had sparked the warning in his mind. There was something behind him—moving.

What had told him? Almost nothing. The merest touch of a foot on the soft pavement—the faintest rustle of clothing—the whisper of something moving through the air.

Almost nothing—but enough. To a man who had played blindfold baseball, it was plenty. He knew that someone not ten paces behind him had thrown something heavy, and he knew its exact trajectory to within a thousandth of a millimeter, and he knew exactly how to move his head to avoid the missile.

He moved it, at the same time jerking his body to one side. It had only been a guess—but what more did a Guesser need?

From the first hint of warning to the beginning of the dodging motion, less than half a second had passed.

He started to spin around as the heavy object went by him, but another warning yelped in his mind. He twisted a little, but it was too late.

Something burned horribly through his body, like a thousand million acid-tipped, white-hot needles jabbing through skin and flesh and sinking into the bone. He couldn't even scream.

He blacked out as if he'd been a computer suddenly deprived of power.

II

Of course, came the thought, a *very good way to put out a fire is to pour cold water on it. That's a very good idea.*

At least, it had put out the fire.

Fire? What fire? The fire in his body, the scalding heat that had been quenched by the cold water.

Slowly, as though it were being turned on through a sluggishly turning rheostat, consciousness came back to The Guesser.

He began to recognize the sensations in his body. There was a general, all-over dull ache, punctuated

here and there by sharper aches. There was the dampness and the chill. And there was the queer, gnawing feeling in the pit of his stomach.

At first, he did not think of how he had gotten where he was, nor did he even wonder about his surroundings. There seemed merely to be an absolute urgency to get out of wherever he was and, at the same time, an utter inability to do so. He tried to move, to shift position, but his muscles seemed so terribly tired that flexing them was a high-magnitude effort.

After several tries, he got his arms under his chest, and only then did he realize that he had been lying prone, his right cheek pressed against cold, slimy stone. He lifted himself a little, but the effort was too much, and he collapsed again, his body making a faint splash as he did so.

He lay there for a while, trying to puzzle out his odd and uncomfortable environment. He seemed to be lying on a sloping surface with his head higher than his feet. The lower part of his body was immersed in chill, gently-moving water. And there was something else—

The smell.

It was an incredible stench, an almost overpowering miasma of decay.

He moved his head then, and forced his eyes open. There was a dim, feeble glow from somewhere overhead and to his right, but it was enough to show him a vaulted ceiling a few feet above him. He was lying in some sort of tube which—

And then the sudden realization came.

He was in a sewer.

The shock of it cleared his mind a little, and gave added strength to his muscles. He pushed himself to his hands and knees and began crawling toward the dim light. It wasn't more than eight or ten feet, but it seemed to take an eternity for him to get there. Above him was a grating, partially covered with a soggy-looking sheet of paper. The light evidently came from a glow-plate several yards away.

He lay there, exhausted and aching, trying to force his brain into action, trying to decide what to do next.

He'd have to lift the grating, of course; that much was obvious. And he'd have to stand up to do that. Did he have the strength?

Only one way to find out. Again he pushed himself to his hands and knees, and it seemed easier this time. Then, bracing himself against the curving wall of the sewer, he got to his feet. His knees were weak and wobbly, but they'd hold. They *had* to hold.

The top of the sewer duct was not as far off as it had seemed; he had to stoop to keep from banging his head against the grating. He paused in that position to catch his breath, and then reached up, first with one hand and then with the other, to grasp the grating.

Then, with all the strength he could gather, he pushed upwards.

The hinged grate moved upwards and banged loudly on the pavement.

There remained the problem of climbing out of the hole. The Guesser never knew how he solved it. Somehow, he managed to find himself out of the sewer and lying exhausted on the pavement.

He knew that there was some reason why he couldn't just lie there forever, some reason why he had to hide where he couldn't be seen.

It was not until that moment that he realized that he was completely naked. He had been stripped of everything, including the chronometer on his wrist.

With an effort, he heaved himself to his feet again and began running, stumbling drunkenly, yet managing somehow to keep on his feet. He had to find shelter, find help.

Somewhere in there, his mind blanked out again.

He awoke feeling very tired and weak, yet oddly refreshed, as though he had slept for a long time. When his eyes opened, he simply stared at the unfamiliar room for a long time without thinking—without really caring to think. He only knew that he was warm and comfortable and somehow safe, and it was such a pleasant feeling after the nightmare of cold and terror that he only wanted to enjoy it without analyzing it.

But the memory of the nightmare came again, and he couldn't repress it. And he knew it hadn't been a nightmare, but reality.

Full recollection flooded over him.

Someone had shot him with a beamgun, that nasty little handweapon that delivered in one powerful, short jolt the same energy that was doled out in measured doses over a period of minutes in a standard nerve-burner. He remembered jerking aside at the last second, just before the weapon was fired, and it was evidently that which had saved his life. If the beam had hit him in the head or spine, he'd be dead now.

Then what? Guessing about something that had happened in the past was futile, and, anyway, guessing didn't apply to situations like that. But, he thought he could pretty well figure out what had happened.

After he'd been shot down, his assailant had probably dragged him off somewhere and stripped him, and then dumped him bodily into the sewer. The criminal had undoubtedly thought that The Guesser was dead; if the body had been found, days or weeks later, it would be unidentifiable, and probably dismissed as simply another unsolved murder. They were rather common in low-class districts such as this.

Which brought him back again to the room.

He sat up in bed and looked around. Class Six Standard Housing. Hard, gray, cast polymer walls—very plain. Ditto floor and ceiling. Single glow-plate overhead. Rough, gray bedclothing.

Someone had found him after that careening flight from the terror of the sewer and had brought him here. Who?

Who?

The sense of well-being he had felt upon awakening had long since deserted him. What he felt now was a queer mixture of disgust and fear. He had never known a Class Six. Even the lowest crewman on the *Naipor* was a Five.

Uneasily, The Guesser climbed out of the bed. He was wearing a sack-like gray dress that fell almost to his knees, and nothing else. He walked on silent bare feet to the door. He could hear nothing beyond it, so he twisted the handle carefully and eased it open a crack.

And immediately he heard low voices. The first was a man's.

". . . Like you pick up dogs, hey." He sounded angry. "He bring trouble on high, that'n. Look, you, at the face he got. He no Sixer, no, nor even Fiver. Exec, that's what. Trouble."

Then a woman's voice. "Exec, he?" A sharp laugh. "Naked, dirty-wet, sick, he fall on my door. Since when Execs ask help from Sixer chippie like I? And since when Execs talk like Sixer when they out of they head? No fancy Exec talk, he, no."

The Guesser didn't understand that. If the woman was talking about him—and she must be—then surely he had not spoken the illiterate patois of the Class Six people when he was delirious.

The woman went on. "No, Lebby; you mind you business; me, I mind mine. Here, you take you this and get some food. Now, go, now. Come back at dark."

The man grumbled something The Guesser didn't understand, but there seemed to be a certain amount of resignation in his voice. Then a door opened and closed, and there was a moment of silence.

Then he heard the woman's footsteps approaching the partially opened door. And her voice said: "You lucky Lebby have he back to you when you open the door. If he even see it move, he know you wake."

The Guesser backed away from the door as she came in.

She was a drab woman, with a colorlessness of face that seemed to match the colorlessness of her clothing. Her hair was cropped short, and she seemed to sag all over, as though her body were trying to conform to the shapelessness of the dress instead of the reverse. When she forced a smile to her face, it didn't seem to fit, as though her mouth were unused to such treatment from the muscles.

"How you feel?" she asked, stopping just inside the room.

"I . . . uh—" The Guesser hardly knew what to say. He was in a totally alien environment, a completely unknown situation. "I'm fine," he said at last.

She nodded. "You get plenty sleep, all right. Like dead, except when you talk to yourself."

Then he *had* spoken in delirium. "How . . . how long was I out?"

"Three days," she said flatly. "Al-

most four." She paused. "You ship leave."

"Leave?" The Guesser said blankly. "The *Naipor?* Gone?" It seemed as if the world had dropped away from his feet, leaving him to fall endlessly through nothingness. It was true, of course. It didn't take more than twenty-four hours to unload the ship's holds, and, since there had been no intention of reloading, there was no need to stay. He had long overstayed the scheduled take-off time.

It created a vacuum in his mind, a hole in his very being that could never be filled by anything else. The ship was his whole life—his home, his work, his security.

"How did you know about the ship?" he asked in a dazed voice.

"A notice," she said. She fished around in one of the big pockets of the gray dress and her hand came out with a crumpled sheet of glossy paper. She handed it to him silently. It was a Breach of Contract notice.

WANTED

for

BREACH OF CONTRACT

JAIM JAKOM DIEGO

AGE: 35
HEIGHT: . . . . . 185 cm
WEIGHT: . . . . . 96 kg
HAIR: . . . . . black
EYES: . . . . . blue
COMPLXN: . . . . . fair

Jaim Jakom Diego, Spacetech

3rd Guesser, broke contract with Interstellar Trade Corporation on 3/37/119 by failing to report for duty aboard home merchantship *Naipor* on that date. All citizens are notified hereby that said Jaim Jakom Diego is unemployable except by the ITC, and that he has no housing, clothing, nor subsistance rights on any planet, nor any right to transportation of any kind.

STANDARD REWARD PLUS BONUS FOR INFORMATION LEADING TO THE ARREST OF THIS MAN

The Guesser looked at the picture that accompanied the notice. It was an old one, taken nearly fifteen years before. It didn't look much like him any more. But that didn't matter; even if he was never caught, he still had no place to go. A runaway had almost no chance of remaining a runaway for long. How would he eat? Where would he live?

He looked up from the sheet, into the woman's face. She looked back with a flat, unwavering gaze. He knew now why she had been addressing him as an equal, even though she knew he was Class Three.

"Why haven't you tried to collect the reward?" he asked. He felt suddenly weak, and sat down again on the edge of the bed.

"Me, I need you." Then her eyes widened a trifle. "Pale you look, you do. I get you something solid inside you. Nothing but soup I get down you so far, all three days. Soup. You sit, I be back."

He nodded. He *was* feeling sickish.

She went into the other room, leaving the door open, and he could hear noises from the small kitchen. The woman began to talk, raising her voice a little so he could hear her.

"You like eggs?" she asked.

"Some kinds," said The Guesser. "But it doesn't matter. I'm hungry." He hadn't realized how hungry he was.

"*Some* kinds?" The woman's voice was puzzled. "They more than one kind of egg?" The kitchen was suddenly silent as she waited intently for the answer.

"Yes," said The Guesser. "On other planets. What kind of eggs are these?"

"Just . . . just *eggs.*"

"I mean, what kind of animal do they come from?"

"Chicken. What else lay eggs?"

"Other birds." He wished vaguely that he knew more about the fauna of Viornis. Chickens were well-nigh universal; they could live off almost anything. But other fowl fared pretty well, too. He shrugged it off; none of his business; leave that to the ecologists.

"Birds?" the woman asked. It was an unfamiliar word to her.

"Different kinds of chickens," he said tiredly. "Some bigger, some smaller, some different colors." He hoped the answer would satisfy her.

Evidently it did. She said, "Oh,"

and went on with what she was doing.

The silence, after only a minute or two, became unbearable. The Guesser had wanted to yell at the woman to shut up, to leave him alone and not bother him with her ignorant questions that he could not answer because she was inherently too stupid to understand. He had wondered why he hadn't yelled; surely it was not incumbent on a Three to answer the questions of a Six.

But he *had* answered, and after she stopped talking, he began to know why. He wanted to talk and to be talked to. Anything to fill up the void in his mind; anything to take the place of a world that had suddenly vanished.

What would he be doing now, if this had not happened? Involuntarily, he glanced at his wrist, but the chronometer was gone.

He would have awakened, as always, at precisely 0600 ship time. He would have dressed, and at 0630 he would have been at table, eating his meal in silence with the others of his class. At 0640, the meal would be over, and conversation would be allowed until 0645. Then, the inspection of the fire control system from 0650 until 0750. Then—

He forced his mind away from it, tried not to think of the pleasant, regular, orderly routine by which he had lived his life for a quarter of a century and more.

When the woman's voice came again, it was a relief.

"What's a Guesser?"

He told her as best he could, trying to couch his explanation in terms that would be understood by a woman of her limited vocabulary and intelligence. He was not too sure he succeeded, but it was a relief to talk about it. He could almost feel himself dropping into the routine that he used in the orientation courses for young Guessers who had been assigned to him for protection and instruction.

"Accurate predicting of this type is not capable of being taught to all men; unless a man has within him the innate ability to be a Guesser, he is as incapable of learning Guessing as a blind man is incapable of being taught to read." (It occurred to him at that moment to wonder how the Class Six woman had managed to read the Breach of Contract notice. He would have to ask her later.) "On the other hand, just as the mere possession of functioning eyes does not automatically give one the ability to read, neither does the genetic inheritance of Guesser potentialities enable one to make accurate, useful Guesses. To make this potentiality into an ability requires years of hard work and practice.

"You must learn to concentrate, to focus your every attention on the job at hand, to—"

He broke off suddenly. The woman was standing in the doorway, holding a plate and a steaming mug. Her eyes were wide with puzzlement and astonishment. "You mean *me*?"

"No . . . no." He shook his head.

"I . . . was thinking of something else."

She came on in, carrying the food. "You got tears in your eyes. You hurt?"

He wanted to say *yes*. He wanted to tell her how he was hurt and why. But the words wouldn't — or couldn't—come. "No," he said. "My eyes are just a little blurry, that's all. From sleep."

She nodded, accepting his statements. "Here. You eat you this. Put some stuffing in you belly."

He ate, not caring what the food tasted like. He didn't speak, and neither did she, for which he was thankful. Conversation during a meal would have been both meaningless and painful to him.

It was odd to think that, in a way, a Class Six had more freedom than he did. Presumably, she *could* talk, if she wanted, even during a meal.

And he was glad that she had not tried to eat at the same time. To have his food cooked and served by a Six didn't bother him, nor was he bothered by her hovering nearby. But if she had sat down with him to eat—

But she hadn't, so he dropped the thought from his mind.

Afterwards, he felt much better. He actually hadn't realized how hungry he had been.

She took the dishes out and returned almost immediately.

"You thought what you going to do?" she asked.

He shook his head. He hadn't thought. He hadn't even wanted to think. It was as though, somewhere in the back of his mind, something kept whispering that this was all nothing but a very bad dream and that he'd wake up in his cubicle aboard the *Naipor* at any moment. Intellectually, he knew it wasn't true, but his emotional needs, coupled with wishful thinking, had hamstrung his intellect.

However, he knew he couldn't stay here. The thought of living in a Class Six environment all the rest of his life was utterly repellent to him. And there was nowhere else he could go, either. Even though he had not been tried as yet, he had effectively been Declassified.

"I suppose I'll just give myself over to the Corporation," he said. "I'll tell them I was waylaid—maybe they'll believe it."

"Maybe? Just only maybe?"

He shrugged a little. "I don't know. I've never been in trouble like this before. I just don't know."

"What they going to do to you, you give up to them?"

"I don't know that, either."

Her eyes suddenly looked far off. "Me, I got an idea. Maybe get both of us some place."

He looked at her quickly. "What do you mean?"

Her gaze came back from the distance, and her eys focused squarely on his. "The Misfits," she said in her flat voice. "We could go to the Misfits."

III

The Guesser had been fighting the

Misfits for twenty years, and hating them for as long as he could remember. The idea that he could ever become one of them had simply never occurred to him. Even the idea of going to one of the Misfit Worlds was so alien that the very suggestion of it was shocking to his mind.

And yet, the suggestion that the Sixer woman had made did require a little thinking over before he accepted or rejected it.

The Misfits. What did he really know about them, anyway?

They didn't call themselves Misfits, of course; that was a derogatory name used by the Aristarchy. But the Guesser couldn't remember off hand just what they *did* call themselves. Their form of government was a near-anarchic form of ochlocracy, he knew—mob rule of some sort, as might be expected among such people. They were the outgrowth of an ancient policy that had been used centuries ago for populating the planets of the galaxy.

There are some people who simply do not, will not, and can not fit in with any kind of social organization—except the very flimsiest, perhaps. Depending on the society in which they exist and the extent of their own antisocial activities, they have been called, over the centuries, everything from "criminals" to "pioneers." It was a matter of whether they fought the unwelcome control of the society in power or fled from it.

The Guesser's knowledge of history was close to nonexistent, but he had heard that the expansion to the stars from Earth—a planet he had never been within a thousand parsecs of—had been accomplished by the expedient of combining volunteers with condemned criminals and shipping them off to newly-found Earth-type planets. After a generation had passed, others came in—the civilizing types—and settled the planets, making them part of the Aristarchy proper.

(Or was the Aristarchy that old? The Guesser had a feeling that the government at that time had been of a different sort, but he couldn't for the life of him remember what it was. Perhaps it had been the prototype of the Aristarchy, for certainly the present system of society had existed for four or five centuries—perhaps more. The Guesser realized that his knowledge of ancient history was as confused as anyone's; after all, it wasn't his specialty. He remembered that when he was a boy, he'd heard a Teacher Exec talk about the Geological Ages of Earth and the Teacher had said that "cave men were *not* contemporary with the dinosaur." He hadn't known what it meant at the time, since he wasn't supposed to be listening, anyway, to an Exec class, but he had realized that the histories of times past often became mixed up with each other.)

At any rate, the process had gone along smoothly, even as the present process of using Class Sevens and Declassified citizens did. But in the early days there had not been the organization that existed in the pres-

ent Aristarchy; planets had become lost for generations at a time. (The Guesser vaguely remembered that there had been wars of some kind during that time, and that the wars had contributed to those losses.) Some planets had civilized themselves without the intervention of the Earth government, and, when the Earth government had come along, they had fought integration with everything they could summon to help them.

Most of the recalcitrant planets had eventually been subdued, but there were still many "hidden planets" which were organized as separate governments under a loose confederation. These were the Misfits.

Because of the numerical superiority of the Aristarchy, and because it operated in the open instead of skulking in the darkness of space, the Misfits knew where Aristarchy planets were located, while the Aristarchy was unable to search out every planet in the multimyriads of star systems that formed the galaxy.

Thus the Misfits had become pirates, preying on the merchantships of the Aristarchy. Why? No one knew. (Or, at least, The Guesser corrected himself, *he* didn't know.) Such a non-sane culture would have non-sane reasons.

The Aristarchy occupied nearly all the planets of the galaxy that could be inhabited by Man; that much The Guesser had been told. Just why Earthtype planets should occur only within five thousand light-years of the Galactic Center was a mystery to him, but, then, he was no astrophysicist.

But the Sixer woman said she had heard that the Aristarchy was holding back facts; that there were planets clear out to the Periphery, all occupied by Misfits; that the legendary Earth was one of those planets; that—

A thousand things. All wrong, as The Guesser knew. But she was firmly convinced that if anyone could get to a Misfit planet, they would be welcomed. There were no Classes among the Misfits, she said. (The Guesser dismissed that completely; a Classless society was ridiculous on the face of it.)

The Guesser had asked the woman why—if her statements were true—the Misfits had not conquered the Aristarchy long ago. After all, if they held the galaxy clear out to the Periphery, they had the Aristarchy surrounded, didn't they?

She had had no answer.

And it had only been later that The Guesser realized that *he* had an answer. Indeed, that he himself, was a small, but significant part of that answer.

The Misfits had no Guessers. That was a fact that The Guesser knew from personal experience. He had been in space battles with Misfit fleets, and he had brought the *Naipor* through those battles unscathed while wreaking havoc and destruction among the massed ships of the Misfits. They had no Guessers. (Or no *trained* Guessers, he amend-

ed. The potential might be there, but certainly the actuality was not.)

And it occurred to him that the Misfits might have another kind of trained talent. They seemed to be able to search out and find a single Aristarchy ship, while it was impossible to even detect a Misfit fleet until it came within attacking distance. Well, that, again, was not his business.

But none of these considerations were important in the long run; none of them were more than minor. The thing that made up The Guesser's mind, that spurred him into action, was the woman's admission that she had a plan for actually reaching Misfit planets.

It was quite simple, really; they were to be taken prisoners.

"They spaceships got no people inside, see you," she said, just as though she knew what she were talking about. "They just want to catch our ships, not kill 'em. So they send out a bunch of little ships on they own, just to . . . uh . . . cripple our ships. It don't matter, they little ships get hit, because they no one in them, see you. They trying to get our ships in good shape, and people in them and stuff, that's all."

"Yes, yes," The Guesser had said impatiently, "but what's that to do with us?"

She waved a hand, as though she were a little flustered by his peremptory tone. She wasn't, after all, used to talking with Class Threes as equals, even though she knew that in this case the Three was helpless.

"I *tell* you! I *tell* you!" She paused to reorganize her thoughts. "But I ask you: if we get on a ship, you can keep it from shooting the Misfit ships?"

The Guesser saw what she was driving at. It didn't make much sense yet, but there was a glimmer of something there.

"You mean," he said, "that you want to know whether it would be possible for me to partially disable the fire-control system of a spaceship enough to allow it to be captured by Misfit ships?"

She nodded rapidly. "Yes . . . I think, yes. Can you?"

"Ye-e-es," The Guesser said, slowly and cautiously. "I could. But not by just walking in and doing it. I mean, it would be almost impossible to get aboard a ship in the first place, and without an official position I couldn't do anything anyway."

But she didn't look disappointed. Instead, she'd smiled a little. "I get us on the ship," she said. "And you have official position. We do it."

When she had gone on to explain, The Guesser's mind had boggled at her audacity—at first. And then he'd begun to see how it might be possible.

For it was not until then that the woman had given The Guesser information which he hadn't thought to ask about before. The first was her name: Deyla. The second was her job.

She was a cleaning woman in Executive territory.

And, as she outlined her plan for reaching the Mslits, The Guesser began to feel despair slipping from his mind, to be replaced by hope.

The Guesser plodded solemnly along the street toward the tall, glittering building which was near the center of Executive territory, his feet moving carefully, his eyes focused firmly on the soft, textured surface of the pavement. He was clad in the rough gray of a Class Six laborer, and his manner was carefully tailored to match. As he was approached by Fours and Fives, he stepped carefully to one side, keeping his face blank, hiding the anger that seethed just beneath the surface.

Around his arm was a golden brassard indicating that he was contracted to a Class One, and in his pocket was a carefully forged card indicating the same thing. No one noticed him; he was just another Sixer going to his menial job.

The front of the building bore a large glowing plaque which said:

VIORNIS EXPORT CORPORATION

But the front entrance was no place for a Sixer. He went on past it, stepping aside regularly for citizens of higher class than his own assumed Six. He made his way around to the narrow alley that ran past the rear of the building.

There was a Class Five guard armed with a heavy truncheon, standing by the door that led into the workers' entrance. The Guesser, as

he had been instructed by Deyla, had his card out as he neared the doorway. The guard hardly even glanced at it before wagging a finger indicating that The Guesser was to pass. He didn't bother to speak.

The Guesser was trembling as he walked on in—partly in anger, partly in fear. It seemed ridiculous that one glance had not told the guard that he was not a Class Six. The Guesser was quite certain that he didn't *look* like a Sixer. But then, Fives were not very perceptive people, anyway.

The Guesser went on walking into the complex corridors of the lower part of the building, following directions that had been given him by Deyla. There was no hesitation on his part; his memory for things like that was as near perfect as any record of the past can be. He knew her instructions well enough to have navigated the building in the dark.

Again, The Guesser found himself vaguely perturbed by the relative freedom of Sixers. As long as they got their jobs done there was almost no checking as to how they spent their time. Well, actually, the jobs to which they were suited were rather trivial—some of them were actually "made work." After all, in a well-run society, it was axiomatic that everyone have basic job security; that's what kept everyone happy.

Of course, there were plenty of Sixers working in construction and on farms who were kept on their toes by overseers, but cleaning jobs and such didn't need such supervision. A thing can only be so clean; there's no quota to fill and exceed.

After several minutes of walking and climbing stairs—Sixers did not use lift chutes or drop chutes—he found the room where Deyla had told him to meet her. It was a small storeroom containing cleaning tools and supplies. She was waiting for him.

And, now that the time had actually come for them to act on her plan, fear showed on her face. The Guesser knew then that he had been right in his decision. But he said nothing about that yet.

"Now are you certain about the destination?" he asked before she could speak.

She nodded nervously. "Yes, yes. D'Graski's Planet. That's what he say."

"Good." The Guesser had waited for three weeks for this day, but he had known it would come eventually. D'Graski's Planet was the nearest repair base; sooner or later, another ship had to make that as a port of call from Viornis. He had told Deyla that the route to D'Graski's was the one most likely to be attacked by Misfit ships, that she would have to wait until a ship bound for there landed at the spaceport before the two of them could carry out their plan. And now the ship was here.

"What's the name of the ship?" he asked.

"Th-the *Trobwell.*"

"What's the matter with you?" he asked, suddenly and harshly.

She shivered. "Scared. Awful scared."

"I thought so. Have you got the clothing?"

"Y-yes." Then she broke down completely. "You got to help me! You got to show me how to act like Exec lady! Show me how to talk! Otherwise, we both get caught!"

He shook her to quiet her. "Shut up!" When she had quieted, he said: "You are right, of course; we'd both be caught if you were to slip up. But I'm afraid it's too late to teach you now. It's always been too late."

"Wha-what . . . what you mean?"

"Never mind. Where's the traveling case?"

She pointed silently towards a shelf, one of many that lined the room.

The Guesser went over and pulled out a box of cleaning dust-filters. Behind it was a gold-and-blue traveling case. The girl had spent months stealing the little things inside it, bit by bit, long before The Guesser had come into her life, dreaming of the day when she would become an Exec lady. Not until he had come had she tried to project that dream into reality.

The Guesser thumbed the opener, and the traveling case split into halves. The sight of the golden uniform of a Class One Executive gleamed among the women's clothing. And she had forgotten no detail; the expensive beamgun and holster lay beneath the uniform.

He picked it up carefully, almost reverently. It was the first time he'd held one since he'd been beamed down himself, so long ago. He turned the intensity knob down to the "stun" position.

"We going to put them on *here*?" she asked in a hushed voice. "Just walk out? Me, I scared!"

He stood up, the stun gun in his hand, its muzzle pointed toward the floor. "Let me tell you something," he said, keeping his voice as kindly as he could. "Maybe it will keep you out of further trouble. You could never pass as an Exec. Never. It wouldn't matter how long you tried to practice, you simply couldn't do it. Your mind is incapable of it. Your every word, your every mannerism, would be a dead giveaway."

There was shock slowly coming over her face. "You not going to take me," she said, in her soft, flat voice.

"No."

"How I ever going to get to Misfits? How?" There were tears in her eyes, just beginning to fill the lower lids.

"I'm sorry," he said, "but I'm afraid your idealized Misfits just don't exist. The whole idea is ridiculous. Their insane attacks on us show that they have unstable, warped minds—and don't tell me about machine-operated or robot-controlled ships. You don't build a machine to do a job when a human being is cheaper. Your fanciful Misfit nation would have dissolved long ago if it had tried to operate on the principle that a lower-class human is worth more than a machine.

"You'll be better off here, doing your job; there are no such havens as Classless Misfit societies."

She was shaking her head as he spoke, trying to fight away the words that were shattering her cherished dream. And the words were having their effect because she believed him, because he believed himself.

"No," she was saying softly. "No, no, no."

The Guesser brought up the gun muzzle and shot her where she stood.

Half an hour later, The Guesser was fighting down his own fear. He was hard put to do it, but he managed to stride purposefully across the great spacefield toward the towering bulk of the *Trobwell* without betraying that fear.

If they caught him now—

He closed his mind against the thought and kept on walking.

At the base of the landing cradle, a Class Four guard was standing stolidly. He bowed his head and saluted as The Guesser walked by.

It's so easy! The Guesser thought, *So incredibly easy!*

Even the captain of the ship would only be a Class Two Exec. No one would question him—no one would *dare* to.

A lieutenant looked up, startled, as he entered the ship itself, and saluted hurriedly.

"It's an honor to have you aboard, great sir," he said apologetically, "but you realize, of course, that we are taking off in a very few minutes."

Words choked suddenly in the Guesser's throat, and he had to swallow hard before he could speak. "I know that. I'm . . . I'm going with you."

The lieutenant's eyes widened a trifle. "No orders have been taped to that effect, great sir."

This is it! thought The Guesser. He would either put it over now or he'd be lost—completely.

He scowled. "Then tape them! I will apologize to the captain about this last-minute change, but I want no delay in take-off. It is absolutely vital that I reach D'Graski's Planet quickly!"

The lieutenant blanched a little. "Sorry, great sir! I'll see that the orders are taped. You wish a cabin?"

"Certainly. I presume you have an adequate one?"

"I'm sure we do, great sir; I'll have the Quarters Officer set one up for you immediately."

"Excellent," said The Guesser. "Excellent."

Fifteen minutes later, the *Trobwell* lifted from the planet exactly on schedule. The Guesser, in his assigned room, breathed a deep sigh of relief. He was on his way to D'Graski's Planet at last!

"Tell me, great sir," said the captain, "what do you think the final decision on this case should be?" He shoved the sheaf of papers across the desk to The Guesser.

The Guesser looked at them unseeingly, his mind in a whirl. For five days now, the captain of the *Trobwell* had been handing him

papers and asking him questions of that sort. And, since he was the ranking Exec, he was expected to give some sort of answer.

This one seemed even more complex than the others, and none of them had been simple. He forced his eyes to read the print, forced his mind to absorb the facts.

These were not clear-cut problems of the kind he had been dealing with all his life. Computing an orbit mentally was utterly simple compared with these fantastic problems.

It was a question of a choice of three different types of cargoes, to be carried to three different destinations. Which would be the best choice? The most profitable from an energy standpoint, as far as the ship was concerned, considering the relative values of the cargoes? What about relative spoilage rates as compared with fluctuating markets?

The figures were all there, right before him in plain type. But they meant nothing. Often, he had been unable to see how there was any difference between one alternative and another.

Once, he had been handed the transcripts of a trial on ship, during which two conflicting stories of an incident had been told by witnesses, and a third by the defendant. How could one judge on something like that? And yet he had been asked to.

He bit his lower lip in nervousness, and then stopped immediately as he realized that this was no time to display nerves.

"I should say that Plan B was the best choice," he said at last. It was a wild stab at nothing, he realized, and yet he could do no better. Had he made a mistake?

The captain nodded gravely. "Thank you, great sir. You've been most helpful. The making of decisions is too important to permit of its being considered lightly."

The Guesser could take it no longer. "It was a pleasure to be of assistance," he said as he stood up, "but there are certain of my own papers to be gone over before we reach D'Graski's Planet. I trust I shall be able to finish them."

The captain stood up quickly. "Oh, certainly, great sir. I hope I haven't troubled you with my rather minor problems. I shan't disturb you again during the remainder of the trip."

The Guesser thanked him and headed for his cabin. He lay on his bed for hours with a splitting headache. If it weren't for the fact that he had been forced to go about it this way, he would never have tried to impersonate an Executive. Never!

He wasn't even sure he could carry it off for the rest of the trip.

Somehow, he managed to do it. He kept to himself and pretended that the blue traveling bag held important papers for him to work on, but he dreaded mealtimes, when he was forced to sit with the captain and two lieutenants, chattering like monkeys as they ate. And he'd had to talk, too; being silent might ruin the impression he had made.

He hated it. A mouth was built

for talking and eating, granted—but not at the same time. Of course, the Execs had it down to a fine art; they had a great deal more time for their meals than a Class Three, and they managed to eat a few bites while someone else was talking, then talk while the other ate. It was disconcerting and The Guesser never completely got the hang of co-ordinating the two.

Evidently, however, none of the three officers noticed it.

By the time the *Trobwell* reached D'Graski's Planet, he was actually physically ill from the strain. One of the worst times had come during an attack by Misfit ships. He had remained prone on his bed, his mind tensing at each change of acceleration in the ship. Without the screens and computer to give him data, he couldn't Guess, and yet he kept trying; he couldn't stop himself. What made it worse was the knowledge that his Guesses were coming out wrong almost every time.

When the ship finally settled into the repair cradle, The Guesser could hardly keep his hands from shaking. He left the ship feeling broken and old. But as his feet touched the ground, he thought to himself: *I made it! In spite of everything, I made it!*

And then two men walked toward him—two men wearing blue uniforms of a ship's Disciplinary Corps. He not only recognized their faces, but he saw the neat embroidery on the lapels.

It said: *Naipor.*

IV

Space Captain Humbolt Reed, commander of the *Naipor,* looked at his Master Guesser and shook his head. "I ought to have you shot. Declassification is too good for you by far. Impersonating an Executive! How did you ever think you'd get away with it?" He paused, then barked: "Come on! Explain!"

"It was the only way I could think of to get back to the *Naipor,* great sir," said The Guesser weakly.

The captain leaned back slowly in his seat. "Well, there's one extenuating cicumstance. The officers of the *Trobwell* reported that you were a fine source of amusement during the trip. They enjoyed your clownish performance very much.

"Now, tell me exactly why you didn't show up for take-off on Viornis."

The Guesser explained what had happened, his voice low. He told about having something thrown at him, about the beamgun being fired at him. He told about the girl, Deyla. He told everything in a monotonous undertone.

The captain nodded when he was through. "That tallies. It fits with the confession we got."

"Confession, sir?" The Guesser looked blank.

Captain Reed sighed. "You're supposed to be a Guesser. Tell me, do you think I personally, could beam you from behind?"

"You're the captain, sir."

"I don't mean for disciplinary

purposes," the captain growled. "I mean from ambush."

"Well . . . no, sir. As soon as I knew you were there, I'd be able to Guess where you'd fire. And I wouldn't be there."

"Then what kind of person would be able to throw something at you so that you'd Guess, so that you'd dodge, and be so preoccupied with that first dodging that you'd miss the Guess on the aiming of the beamgun because of sheer physical inertia? What kind of person would know exactly where you'd be when you dodged? What kind of person would know exactly where to aim that beamgun?"

The Guesser had seen what was coming long before the captain finished his wordy interrogation.

"Another Guesser, sir," he said. His eyes narrowed.

"Exactly," said Captain Reed. "Your apprentice, Kraybo. He broke down during a Misfit attack on the way here; he was never cut out to be a Master Guesser, and even though he tried to kill you to get the job, he couldn't handle it. He cracked completely as soon as he tried to coordinate alone. We've actually missed you, Master Guesser."

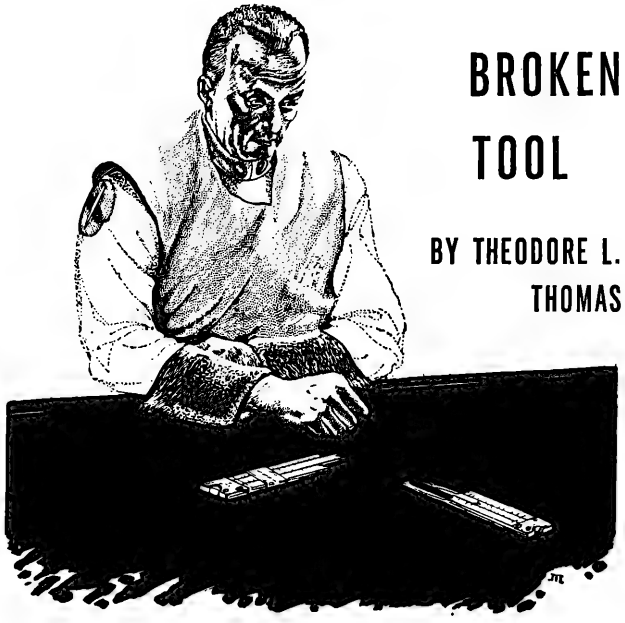
"May I see to the disciplining of Kraybo, sir?" The Guesser asked coldly.

"You're too late. He's been declassified." The captain looked down at the papers on his desk. "You may consider yourself reinstated, Master Guesser, since the fault was not yours.

"However, masquerading as an Exec, no matter how worthy your motives, cannot be allowed to go unpunished. You will report to the Discipline Master for a three-and-three every day for the next five days. And you will not be allowed to leave the ship during the time we remain in repair dock. Dismissed."

"Thank you, great sir." The Guesser turned on his heel and marched out, heading for the Discipline Master.

It was good to be home again.

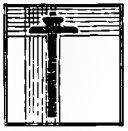


BROKEN TOOL

BY THEODORE L. THOMAS

To be of use to the Space Command, a man must be fundamentally a yo-yo—a puppet—tied to the end of a string. Which may sound wrong...but there's a reason...

Illustrated by Martinez



HE slide rule broke in half in Carter's fingers. He dropped the pieces onto the folder, and looked up to meet the gaze of Cecil Hardy. Carter said, "I want this one, Cecil. I want this one badly." His lips moved, but his teeth remained clenched.

Hardy nodded slowly. "I know you do, Walter. I know how you feel."

"Do you?" Carter stood up and stepped over to face a bank of instruments. His back was toward Hardy. "Do you? I raised that boy from a pup. I took what they sent me and out of it I made a man. I made the best man the Academy has ever seen. I saw the raw material was there so I gave him the best I've got, and he soaked it all up like a sponge. He's got deep space in his marrow, that boy. He's got—" Carter broke off, and then added, "If young Walt had lived, he'd be just like Lightner. You see how it is?"

Hardy rose from his chair and placed a hand on Carter's shoulder. He turned Carter around so he could see his face, then he said, "I've known how it was for years, Walter. I've watched it."

Some of the steel went out of Carter's back. "You mean it was noticeable?"

Hardy smiled and shook his head. "No. Not noticeable in the sense you mean. I noticed it because it is my business to notice such things, and because you and I have been friends for a long time. I've seen what happens to your eyes when you look at Lightner. But nobody else would notice."

Carter blew out his breath, ran a hand through his short iron-gray hair, and nodded. "I tried not to let it show."

"You didn't. You kept it concealed pretty well, I thought. Maybe too well. Lightner does not think of you the way you do of him."

"I know. I couldn't possibly let him suspect the way I felt; that would have been intolerable. That's all the more reason why I've got to see him in deep space—to make it up to him. That boy will take over the Deep Space Command some day. When he does he'll be a better man than I am. He's got to make it—for me, for himself, and for Earth itself. Men like that are rare. We need them."

Hardy looked at the chronometer and said, "Well, we'll soon know. He's putting his flier down just outside the town now. He'll be home in a few minutes. I'd better see to my instruments." He turned and began snapping switches and adjusting dials.

Carter stepped to his side and said, "Cecil."

Hardy looked at him questioningly.

"Why is it necessary to do this in Lightner's case? He's been superlative in everything for years. We can safely skip this and pass him anyway."

Hardy's eyes widened. "Walter, you don't really mean that. This final

test is the only means we have of getting down to the core of the man. His emotions on going home will tell us whether he really is a deep-space man or just another very skillful space pilot. We have no other way of knowing. You know we must do this." He paused, and said, "Why are you so afraid of this test, Walter? Do you know something I don't? Are you afraid Lightner won't pass it?"

Carter's back stiffened. "Of course not. Go ahead, run your test. The boy will come through."

A thousand miles away Lightner dropped his flier onto a small field. The ship had not stopped before he bounded from the cockpit and looked around. It was late afternoon. The breeze had waned and the air lay still over the land. Lightner bent his head back and breathed in the smell of the sun-drenched grass. He looked to the southwest, into the setting sun, and saw there the tall pin-oak standing unchanged. What branch had it been? The third from the top? Shading his eyes from the sun he carefully inspected the branch, but there were no traces of the kite that had flopped there for years. Even now, looking at the branch, Lightner could feel the time-washed agonies of that young boy who watched the destruction of his first-built kite on that branch. He smiled, remembering the gentle voice of his father, arm around shoulders, explaining that this was the stuff of life, and how the two of them built an even better kite that flew high and steady for days on end.

Lightner turned and walked down the road that led to town. He walked fast at first, but then he slowed his pace as memories pushed into his mind. Here was the fence, no longer suitable for that game of long ago, the gaps in it rendering impossible the requirement that a boy travel a quarter mile without touching the ground. Was it here? No, there, where stood the thorny bush in which he and Joey Knobb had thrashed around with gory murder the momentary object; finally they had gone home together covered with lacerations and punctures not one of which was caused by anything done by the other boy. Lightner grunted; Old Man Carter would not have thought much of his prowess in that fight.

Ahead was the final bend in the road, and the great willow tree stood as always, mushrooming above the other trees, looming out over the road. Lightner walked under it, into the tree-tunnel where the branches had been cut away to allow the passage of vehicles on the road. Under the tree was the usual tree litter, and through it, over on the other side was the cemetery. Lightner could see the headstones through the low-sweeping branches of the willow, glowing stone-white against the green background. He looked toward the part where his mother and father lay buried, and almost, he turned off the road, but he did not. The road completed its turn and widened into the straight run of concrete that was Main Street. Lightner stood still and looked down.

The setting sun was at his back, and the slanting rays cast a reddish glow down the street. A few people sauntered along the sidewalks, and an occasional car moved down the street and turned off. The soft sound of voices and the purr of motors came to him through the still warm air. Lightner shook his head. It had not changed. Here and now, in a time when men fought toward the stars, was a town—his town—standing as it had stood for a hundred years. Would another hundred years see any change? Lightner shook his head again, and walked to the sidewalk.

He passed Murphy's Garage, backed in against the trees at the edge of town. Soon he passed some people, one of whom he knew, but he did not stop. They looked questioningly at the tall lithe figure in the uniform of a Senior Space Cadet that glided silently by. But it was not until he walked past Martin's Drug Store that anyone spoke.

Mr. Martin detached himself from the group that loitered in front, stepped up to him, and said, "Aren't you John Lightner's boy?"

Lightner smiled, thrust out his hand, and said, "Hello, Mr. Martin."

Mr. Martin took it, and while shaking it he turned to the group and called, "Look who's here. John Lightner's boy, Billy, come to pay us a visit."

The group resolved itself into individuals, and they all gathered around. Many of them Lightner knew and he was busy shaking hands and telling them he was well.

There came a time when the invitations for a visit had all been extended, the latest news discussed. A half-silence fell, and they stood smiling at him and looking self-consciously down the street. Lightner saw they understood; he wanted to move on and see his home, and they did not want to bar his way. He waved good-by, and walked.

Past the Feed Store he went, where a farmer loaded his truck with bags of feed concentrate. Lightner could smell the dry haylike aroma of the feed wafted to him by the breeze that began to stir in the gathering dusk. He turned the corner on his street, walked two blocks, and then realized that he was in front of Agnes Moore's house. He looked at the dark front porch and he remembered another time, long ago, when the porch had been dark.

The porch swing was still there, the one he and Agnes had been sitting on, quiet and tense, with the feeling of thunder in the blood. There was a round shoulder nestled close up under his arm, and the moment came when their breathing seemed to stop, and then begin again, quick and short. At that instant her father unexpectedly swung up the front walk and found them sitting rigid and quite far apart on the porch swing. If he had suspected anything he gave no sign, for he nodded pleasantly and walked into the house.

Lightner smiled as he remembered the episode. He felt no trace of em-

barrassment, only a kind of mild surprise that he should once have considered such things important. There were lights coming on in the Moore house, but he did not go up to the door.

He turned and went on, and in the next block he stopped before his house. It was dark; the present owners were apparently not at home. There was little change. The privet hedge had been cut way back, and there were new bushes where the front walk joined the side walk, and there was a new coat of paint. But it was his home, and he stood on the side walk in the gathering darkness and looked at it. A host of memories filled his heart and flooded his mind.

And a thousand miles away two men watched with desperate intensity as the pens drew their inky traces across the creeping ribbons of paper.

Lightner looked at his home, and then he looked up through the trees that shrouded it. Gleaming faintly through the leafy branches were the stars. Lightner stepped out into the street where he could get an open view of the evening sky. He stood with feet wide apart and head tipped back, staring at the stars. And the stars seemed to stare back at him.

The distant suns smiled on him, and winked beckoningly. Like a woman, he thought, aloof, distant, cool, yet inviting—so inviting to come and taste the things unseen, the hot wash of half hidden fires. Lightner's breath came quick, and his mouth opened.

There was his life. There was what he was for. All the training, the pounding years, the operations, the grueling study and toil, the deprivation, all of it was, after all, for the single purpose of fitting him to be a creature of those suns. Many had tried to turn him aside, but he had won through. Carter, Old Man Carter himself, had taken up the task of punishing him as no other man in the Academy had been punished, harsh long hours of work when the others rested, constant practice toward a perfection no other approached. But he had showed them. He had taken the worst they had to offer and soaked it up like a sponge. They could not stop him now; now he was ready. Now, despite everything they had done to stop him, he was ready for deep space.

Lightner's arms raised slowly from his sides, raised until they stretched overhead. He stood with feet wide apart, head tipped back, arms reaching up toward the stars. Thus he stood.

His breath rattled in his throat. The sound of it jarred him and brought him back to where he was. He dropped his arms and looked wildly around, and half staggered to the side walk. His home loomed in front of him in the darkness and he smiled at it, a tight, grinning sort of smile. It was pleasant to see it again, but what was he doing here? This was not where he belonged. He glanced up. Out there, that was his destiny, in deep space. He laughed aloud and felt contentment well

through him. And with singing heart he turned to go back to the flier. He walked swiftly now, looking neither to the right or the left.

Hardy sat back after a lengthy and detailed study of the charts. Before he could speak Carter saw the answer in his face, and Hardy saw that he knew. Reaching across the table Hardy placed a hand on top of Carter's hands and said, "Walter, I am sorry. I am so very very sorry."

Carter made no answer.

Hardy said, "You see how it is. A man must believe in something greater than his ambition. He must have roots."

Carter made no answer.

"This boy has nothing to come back to, no fundamental ties with Earth. Deep in his heart he is not interested in us or our planet. He wants nothing but deep space; he puts it ahead of everything."

Carter said nothing.

Hardy grabbed both of Carter's hands and shook them. "Walter, that boy is a fanatic. You can't have that kind of man in deep space. He's no good for you, or the Command, or Earth. Don't you see that?"

Carter looked up, and Hardy saw his eyes. There was a strange wildness in them unlike anything Hardy had seen before.

Carter took a breath to speak, but Hardy spoke first. "Don't say it, Walter. Look, when that boy is under stress his decisions might be those of a madman. He might react normally, but the chances are he won't. He loves space so much he's not stable; a man has to love something else more than the thing he devotes his life to, otherwise he's a fanatic and you can't trust him. Same way with you right now. You love this boy, but— How do those lines go?

'I could not love thee half so much
Loved I not honor more.'

There's the answer to your problem."

Carter bent his head forward and rested his forehead on his clasped hands. He sat motionless, and then his forearms quivered and his hands grew white from the pressure of the clenched fingers. He slammed his hands on the table top, and reached over and picked up the broken pieces of the slide rule. He jostled them in the palm of one hand, staring at them, and then he looked up at Hardy. The wildness was gone. He said, "It's all right, Cecil. Thank you, thank you very much." And he tossed the broken slide rule into the wastebasket.

THE END

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

STRAW

BY ALGIS BUDRYS

***Traditionally,** a drowning man clutches at straws. But the way the Syndicate used that tradition was...well, an interesting variant, anyhow.*

Illustrated by Schoenherr

NEVITABLY, the city was called Atlantis. Frank Hertzog, of International Tours, Incorporated, stood on the brink of empty air, his toes a hairsbreadth away from the outslanting invisible glass sheet that formed one wall of his office. He looked far out across the ocean, swelling a thousand feet below, and watched the curling traceries of pleasure-craft wakes upon the deep green water. The white, tall buildings reared upon their piles to either hand, each walled in perfect glass, each tier apparently stacked unsupported in the air. Hertzog was prompted to wonder whether, like its namesake, the city could long keep from sinking into ruin on the ocean floor.

He grinned to himself, and his prominent ears twitched in response. He turned around suddenly, an awkward-looking man full of loose joints, and walked back toward his desk.

The huddled man in the soft visitors' chair asked bitterly: "Is there something funny about me?" He was an old man, with unhealthily sallow skin and deep crows' feet at the corners of his wet eyes. He had come down to Hertzog's office under escort by ITI special agents, and he had made no move to escape. He was dressed in clothing whose price would have bought Hertzog's wardrobe for a year, but which seemed to be just a shade out of style.

Hertzog shook his head, still grinning. "I was thinking about something else. Pretty foolish of me, considering how this place's been here for a hundred years."

"I beg your pardon?" the visitor said.

"Not at all, not at all," Hertzog said with an airy wave of his hand, and looked down at his desktop with an expression of mild surprise. "Well, now," he said quizzically, pulling a folder out of the fax, "your file seems to have gotten here already, Mr. Bliss. They must have hired a new clerk for me." He spread it open on the desktop, pursed his wide lips, and flipped through the pages.

"Arkady Bliss, occupation theatrical entrepreneur, residence Stormking House, Atlantis," he said to himself. "Filed affidavit of theft, twenty International Tours, Incorporated travelers' checks in denomination one thousand, March 18th. Received refund, March 20th. And today is April 1st." He spun the file around and pointed to twenty one-thousand-dollar travelers' checks pinned to the inside of the folder. Each had been countersigned and cashed between March 20th and March 31st, in various places around the city, as though Bliss had made a tour for the express purpose of raising cash. ITI's handwriting experts had declared all twenty countersignatures genuine. "April Fool, Mr. Bliss," Hertzog said. "Are those your signatures?"

Arkady Bliss leaned forward and studied them for a long time. Finally he looked up and nodded. His lower lip was quivering slightly.

"Well, now," Hertzog said, "you

owe us twenty thousand dollars, Mr. Bliss. How say you?" He grinned cheerfully at the other man and rubbed together the thumb and fingers of one upraised hand.

"I . . . I didn't sign those checks," Bliss mumbled. "I told you the truth on my affidavit. They were stolen from me."

"Now, *there*," Hertzog said, pointing a stiff finger at Bliss' face, "is where you're wrong. Even a semi-skilled forger could fake your signature well enough to pass visual inspection. Why, *I* could do it. But it would really take something to fool our experts, Mr. Bliss. Those are your signatures, done with your pen by your hand. Mr. Bliss, International Tours, Incorporated, cannot very well refund you for stolen checks you then go out and spend. I say again, you owe us twenty thousand dollars. How say you further?"

"I don't know what to say." Bliss rubbed his hand over his eyes. "If I'd known I was going to be called down here and badgered, I wouldn't have filed the claim. I would have taken my loss." The billowing folds of his bright apparel now seemed even more oversize. The jewels on his rings seemed dim and lusterless.

"You couldn't afford to take your loss," Hertzog said gently. "You're broke. How long ago did you hock your gems and replace them with substitutes?"

Bliss jerked his hand down and buried it in the folds of his cloak. Then he gradually edged it out again and looked down at it with an empty expression. "Several months ago."

"About the same time you bought the checks?"

"I used the money to buy the checks, yes."

"Planning to leave us, Mr. Bliss?"

"What business is it of yours?"

"Why, we're your creditors now, Mr. Bliss," Hertzog smiled. "We care a whole lot about you . . . your hopes, your dreams, your disappointments—especially those."

He looked down at the file. "Let's go over it all, Mr. Bliss. Three months ago, you paid an ITI subagent at the City National Trust Company twenty thousand dollars plus charges for twenty one-thousand-dollar travelers' checks. You signed each check once, leaving the space for countersignature blank. What you did with the checks immediately thereafter, we don't know. We assume you put them away in a safe place. You certainly didn't use any of them."

"I put them in my safety-deposit box. I said so in my affidavit of loss. You can read it there."

Hertzog nodded agreeably. "Certainly. Certainly. But we've already noticed one discrepancy in your affidavit, haven't we?" He extended a packet across the desk. "Smoke? No? Then I won't, either. Now. To continue. You were already in financial difficulty. How do we know? You paid us by personal check, and the check bounced. Your account was five dollars short. You'd failed to allow for a service charge. We agreed to waive that sum, and the bank paid us

the difference. We don't sell the checks to make a profit anyhow. It's your travel accommodations we want our piece of. But the bank wouldn't honor your overdraft, Mr. Bliss. That's a tip-off."

"Why should I have just one account?" Bliss flared.

"Why not?" Hertzog shot back. "And what about a credit rating that won't stretch to five dollars?"

Bliss stirred uncomfortably in the chair. "I wonder if you could open the window, Mr. Hertzog? It's hot in here."

"Certainly." Hertzog nudged a button on his desk. A red light blinked up immediately beside it. He frowned and pushed the button again. The light stayed red. He looked up, grimacing. "Sorry. It's busted. Modern engineering know-how, Mr. Bliss." He pushed a carafe over from the corner of his desk. "Drink, instead?"

Bliss shook his head. "No. No, thank you. I'm . . . I'm all right now."

"Getting back, now—" Hertzog said. "On March 18th, you came in and spoke to our Mr. Hogan in the Refund Claims office downstairs. You filed an affidavit stating that on the morning of the same day, you withdrew the checks from your safety-deposit box in the City National Trust and that, twenty minutes later while you were on a public conveyance, your pocket was picked. You discovered the loss only upon arrival at your destination, wherefrom you came straight to our offices and made your report. You swore the checks had not been countersigned. That is, none of them had been rendered negotiable. On the basis of your affidavit, a refund check was prepared. It was held until the sale of the checks was verified from our records, and until we established that none of the checks had yet been cashed and presented to our bank by the clearing house. The refund check was then delivered to you on the morning of the 20th. A half hour later, the first of the supposedly missing checks was cashed, in the Stormking House casino, with your undisputably genuine countersignature thereon. Mr. Bliss, how say you three times?"

"I can't explain it." Bliss seemed to have gathered himself a little. His weak jaw was set, and his voice was stubborn.

Hertzog sighed. "You produced 'Mermaid's Revel,' didn't you? And 'Fire Fountain'?"

"Yes."

"Smash hits. Multimillion dollar hits. Where's the money, Mr. Bliss?"

"That was three years ago," Bliss said testily.

Hertzog shook his head. "Wine, women, and song—some other producer's song, I hope?"

"Does it matter? What business is it of yours? Look, Hertzog," Bliss said, taking refuge in anger, "there's such a thing as common good manners. I don't think you'd like it if I wrote a letter to your superiors."

"Can't," Hertzog said. "I'm my superiors. I own the whole shebang.

President and Chairman of the Board."

Bliss opened his mouth. "But—"

"Why weren't you told who Mr. Hertzog was? Why should you be? I'm just as competent no matter what you call me. What difference would it make in handling your case?

"Why am I fiddling around with detail work, instead of making Olympian decisions from some golf course? I built this outfit with my own brains and sweat. Am I supposed to let somebody else know more about it than I do?

"Back to business, Mr. Bliss. What're you going to do now? There's twenty thousand dollars of ITI money tied up in you, and it doesn't bore me to repeat the fact. You're sure you can't account for these signatures?" Hertzog looked sharply at Bliss.

"No!"

"All right. Then you've got a week to pay us back. After that, we go to law. Clear?"

Bliss refused to panic. Perhaps he had exhausted his capacity for it. His face had turned paler, but he stuck to his guns. "I'll do what I can."

"All right, Mr. Bliss," Hertzog said disappointedly. "I'll see you here next Friday, then."

Bliss got to his feet and walked toward the door.

"Mr. Bliss," Hertzog asked, "what was in your mailbox this morning?"

Bliss stopped. He actually seemed to lose control of his knees for a moment. His face broke out in perspiration. "Nothing," he said huskily.

"Nothing? Not even a straw?"

"A what?" Bliss mumbled.

"A straw. What a drowning man clutches at."

"No! No, nothing like that!" Bliss cried, and hurried out.

Hertzog studied the closing door. He stabbed a button on his desk. "Keep tailing him," he said to his desktop. "Stay close. Keep him alive. He already tried to dive out my window." He pressed another stud. "Hoke. Come on by my office." Then he put his feet up on the desk and chewed his lip until Hoke Bannister came in the door.

Hoke Bannister, First Vice President, was a stocky, ugly man who sat on the edge of the desk and said "Yeah?"

"If I don't show up tomorrow, mind the store for us, will you?"

"Sure," Bannister said, "but what's up?" He reached for the cigarettes.

"Not those. They're full of neoscopolamine," Hertzog said. He reached in a drawer, pulled out a sealed pack, and tossed it across the desk. "Stay away from the liquor, too." He nudged the Bliss file abstractedly with one toe, frowning at it. "I've got a little setup arranged with the special agents down in Refund Claims. If I turn out missing by tomorrow, check with them and then come looking for me." He used the side of his ankle to push a lighter toward Bannister.

"You know, Hoke, we've got mu-

nicipal elections coming up next month," he said casually. "What d'you use for politics, anyway?"

"Politics?"

"You one of these people that thinks Atlantis ought to stop being just a commercial center, and move in on the mainland nations?"

Bannister snorted, the smoke jetting out of his nostrils. "And get tied down to a bunch of dirt-farm problems we don't even know what to do with? We're a free port, we get our handling commissions, we live mighty well, and we're never going to be hungry. Who wants it any other way? But, why worry? Hardly anybody bothers to vote. Why should they? The City Council never does anything to stir things up."

"I hear things, here and there."

"It's a bunch of guff. Who'd want to rock the boat? It'll never amount to anything."

"Everything's calm and peaceful, huh? Open, aboveboard, and trustworthy?"

"You're leading up to something."

"Me?"

There was a sudden sharp *splat!* as the loaded cigarette exploded an inch from Bannister's nose.

Hertzog grinned. "Well, maybe I was."

Atlantis sparkled in the sun, alive with color and movement, shimmering in reflection from the water. Hertzog watched it fondly all the way down the glass-walled chute, and when he jumped off at the company boat landing, he stopped to listen to the sound of boat engines and helicopter fans. Then he dropped into the waiting boat, blipped the throttle, and moved out into a stream of traffic growling along the breadth of Triton Way toward Pleasure House. His motions at the controls were apparently haphazard, but the boat somehow found its way through crannies in the traffic that were opening and closing at considerable speed.

As he guided the boat, he whistled loudly over the sound of the engine and nodded pleasantly to the occasionally startled occupants of the craft he slipped by.

It was three-thirty. The business houses were closing, and most Atlanteans were headed toward the center of the ten-square-mile city, where the singing tower or Pleasure House shot up thirty levels higher than any other structure, and where the city customarily took its ease.

Hertzog usually stayed down on the lower levels, where the stores were quietly priced and the entertainment ranged from pinball machines in the drugstores to movies in small fifteen hundred seat theaters. He liked the lower levels. He had been accustomed to them in his childhood, and he had explored them until every fruit-juice stand and candy store was as familiar to him as the two room apartment, four hundred feet below sea level, in which he lived now and which cost him upwards of a hundred dollars a day in return for isolation and quiet.

As he nosed into a Pleasure House dock, a teak and bronze yacht swept

majestically by and rocked him with its wash. "Money, money, money," Hertzog muttered, and jumped up on the dock. He strode along it to the yacht, and leaned against a bollard while its crew moored it and ran out a gangplank for the portly, overdressed man who stepped ashore.

"Beg pardon," Hertzog murmured as the man passed by him.

"Eh?"

"What's your tailor's name?"

The yachtsman raised his eyebrows. "Packenham, if it's any of your business."

"And that would be what address?"

"Level 112, Pleasure House."

"Thank you, my friend," Hertzog said, bowing low, and stepped into an up chute.

He stepped out of Packenham's sometime later, wriggling his shoulders in the unfamiliar tailoring, then turned into the tobacconist's next door. Presently he emerged with twelve clear Havanas in a platinum case with a large stone in its lid. He lit one of the cigars and began dropping in on other specialty shops, his face gradually taking on the vaguely narcotized glow of a man spending large amounts of money on himself. He had dinner in the Ocean Grille, and from there he went on a tour of the high-level drink lounges until midnight.

The roof of Pleasure House burned like a torch at night, aflame with gold and scarlet lighting that could have been seen from the European coast like a beacon on the horizon. There were charter amphibians that ran from Sevastopol and Basle, inside the long strip of devastated territory, and brought in the few continentals who could afford it. There were a certain number of less-well-off and determined individuals who took the dizzying, much cheaper ride in the cramped passenger compartments of the dollies in the goods tubes. But by and large the beacon burned unanswered. Pleasure House, and Atlantis, were for the Atlanteans. Not that the average man-in-the-street had ever seen the Top Level Club.

"Wow!" Frank Hertzog exclaimed reverently as he stepped out of the up chute onto purple plush and stood transfixed at the splendor before him.

The lights on the heavily tinted glass roof filtered through into the club as a smoky red-gold haze, caught and highlighted by glittering crystal and polished bronze. Open torches burned without smoke or heat, or much widespread light, in sconces on the draped walls. Liveried servitors moved obsequiously among the tables and couches that took up about a third of the floor space, or slipped discreetly between the drapes of the private rooms along one wall. On a dais to one side, an orchestra thick with violins and saxophones played softly for the couples swirling on the dance floor.

The remaining half of the room was taken up by gaming tables, and

most of the crowd was clustered around them, laughing and buzzing behind an acoustic wall of directed music that let them cry out with joy or disappointment without disturbing the people at the service tables. The crowd was brilliantly, expensively dressed and ornamented. The music was perfect. The refreshments were exquisite.

"Wow!" Hertzog said again. "What a place for a country boy!" He moved toward a tuxedoed man who could only have been the major-domo, and stopped in front of him with aggressive awkwardness.

"Say," Hertzog said, "I want a little table where I can sort of sit and get my bearings. Something near the dance floor. What time's the show start?" His voice carried some distance, drawing annoyed looks.

"There is no show, sir," the imperturbable man replied gently. "Perhaps you were thinking of the High Roll Club on Level Fifty? Our clientele prefer to use their own resources for entertainment."

"No show, huh? Well, now. I figured a place as classy as this would serve up something special." He put a quick hand. "I know. I know. The High Roll Club on Level Fifty. I've seen it and the babes are for the dogs. S'pose you dredge me up a table anyway, and I'll see what kind of resources I can throw together." He flipped open a new alligator wallet and pulled out a bill. "Here's five hundred for your trouble." He winked aside to a couple at the nearest table, who seemed startled.

The major-domo's eyebrows rose. "Please step right this way, sir," he said, walking briskly toward a centrally located table. Hertzog followed him with a wide grin. "You know," he murmured to himself, "this could get to be a pretty insidious feeling if you let it."

The major-domo bowed him to his table, and called over a servitor with an imperative snap of his fingers. People all around Hertzog were staring at him openly, now.

"May I attend to your needs, sir?"

"Huh? Oh, yeah, sure." Hertzog looked amiably up at the hovering servitor. "How's about some champagne?"

"Of course, sir. What vintage, sir?"

Hertzog's brows knitted. "Oh, what the heck!" he said with sudden inspiration, "Just bring me the most expensive stuff you got."

"Very good, sir," the servitor murmured, bowing so low that Hertzog could not have seen any facial expression he chose to wear.

Hertzog's own expression had gone back to its open-faced grin. "And get the band to play some show tunes," he said. "Something out of 'Mermaid's Revel' or 'Fire Fountain.' Here . . . give 'em this." He peeled a thousand out of his wallet and held it out in two fingers.

"Yes, sir."

The servitor left, and after a moment the orchestra began a muted medley of songs from Arkady Bliss productiόns. Hertzog beat time contentedly with the base of his glass

against the tablecloth, and whistled along with the music.

By the end of an hour, Hertzog was pleasantly conscious of the fact that nearly every eye in the house was following him, no matter what he did. He could also see that some of the people from the other places he'd been earlier had now circulated into the Top Level Club, and there was a gratifying amount of whispering going on.

"Heady, heady, heady," he murmured, strolling to the gaming tables. He flipped a sheaf of bills in front of the cashier. "All blue," he said, and collected a stack of chips. Wandering over to the craps layout, he waited until the dice came to him, bet a handful of chips without bothering to count them, and rolled. Whistling through his teeth, he picked up the dice on the return, winked at the circling crowd, rolled, and made his point. Leaving his winnings, he rolled again, threw a seven, and simultaneously said, "Why, hello, Traven," to a man he noticed standing back from the crowd. "Didn't see you standing there."

Traven, who served as clerk of the City Council, nodded back with some constraint. Hertzog winked, rolled, won again, still didn't pick up any of the considerable pile of chips, rolled again, and lost it all. "Your turn, friend," he grinned at the next shooter, and drifted back out of the crowd. The stickman was still raking in chips.

He was dabbling in roulette when he felt Traven's bulk push in beside him. "I'd like to talk to you, Frank," Traven said sternly.

"Sure 'nuff. Nice to see you. Hold on a second, though—I wanna see how this play comes out." The ball settled into a slot, and he shrugged. "That sure doesn't look like my number," he said. "Well, easy come, easy go." Walking out of the gaming area, he turned to Traven and said: "Pretty nice place, up here."

Thad Traven was about ten years older than Hertzog, thin, dark, and purse-mouthed. "You won't be able to afford it very often, at this pace."

Hertzog raised his eyebrows. "My money," he said mildly.

"I'm aware of that." Traven was both indignant and embarrassed. "Look, Frank, I know it's none of my business. But I don't like to see it getting to you. You're cutting a swath that's being talked about all over the top ten levels."

"It?"

Traven gestured sharply. "You know what I mean. This is a wide-open city. A man with intelligence and energy can rise up from poverty to fantastic wealth. Your own life stands as a perfect example of that. But too many people don't know how to handle it, once they've got it. It goes away as fast as it came in—faster. Frankly, up to now I'd always thought of you as exceptionally level-headed. This kind of exhibitionism . . . why," Traven sputtered, "up until tonight, I don't suppose anyone without access to the tax rolls had any idea of how much you're worth.

I doubt if many of them knew who you were."

Hertzog spoke softly. "Right. Maybe I got sick of just making it and not getting any pleasure out of it?"

"Do you enjoy this kind of place?"

"I could get to like it," Hertzog said soberly. Then he grinned. "What's the matter, Thad—scared I won't have enough left to contribute to the campaign fund?"

Traven looked at him gravely. "That's not as much of a joke as it might be. You know what people are like—they're happy, they're busy; they don't bother thinking about politics. It's a banner year when two per cent of the electorate registers to vote, and a landslide when one per cent votes. Arousing their interest in the City Council is practically impossible."

"So? So the councilmen have practically lifetime jobs, and as long as they keep the taxes low and stand back out of the way of commerce, everybody's happy. I don't see your beef."

"Just this," Traven said worriedly. "For the first time in years, we're running into an active opposition campaign. You don't see any posters, but that's because nobody would stop to read 'em. It's being done down on the precinct level—the only way it could be done, with this happy-go-lucky populace. Word-of-mouth whispering campaigns; public relations office plants in the papers and magazines; why, they're even buying sneak plugs from the entertainment

scripters. I don't suppose you've noticed how much expansionist sentiment there is in the current fiction. Or in the back-fence gossip. It's a fantastic campaign—someone's pouring enormous amounts of money into it."

"Who?" Hertzog seemed to be taking it lightly.

Traven shook his head. "We don't know. It could be anybody. You know as well as I do we haven't got enough police to make a real investigation. We'd have to be able to separate out the entrepreneurs who're smart enough to see that an empire would make them fabulously rich at the start, without being smart enough to see what a headache it would get to be, or where it would end. Unfortunately, that doesn't show up as a clear mark on a man. This gang could be composed of half the people in this room right now, and we'd never know it. And if they win out, Atlantis'll last perhaps one or two generations before the strain of ruling the world sours us all, sours the world, and gets us stamped flat in a general rebellion." Traven's face was grave. "I've got children. They'll have children. I don't want them getting hit with hydrogen warheads."

"You seriously worried?"

"Damned right I'm worried. We are doing our best, but if this keeps up we might just lose the election. That's why I hate to see you acting like a fool. You're one of the people I thought we could count on."

"Well!" Hertzog was grinning. "Well, now. I never would 'a thought it." He clapped Traven heartily on the shoulder. "Cheer up, Thad. I'll be sending a little something your way pretty soon, now."

Traven's mouth shut tight, and his lips disappeared entirely for a moment. "Not if you throw it all away here, first."

"Thad, m'boy, it's an investment," Hertzog said genially. "Just an investment."

Traven stalked away.

Hertzog went back to the gaming tables, stopping a servitor on the way and ordering more champagne.

Several hours later, Hertzog hit a hot streak at the table. By now everyone in the gaming area was clustered around him, and almost as much money was riding his bets as he had put down himself.

Laughing, he tried eight rolls before he made his point, and when it came up at last, he swung his arm out in an all-encompassing sweep and cried out: "Everybody drinks on me. Wups, pardon me, Miss."

He had stumbled lightly against a tall blond girl in a tight-fitting dress. She smiled at him from under lowered eyelashes and murmured: "I'm sure I can't blame you. For being excited, I mean." She stared down at the pile of Hertzog's winnings. "That's an awful lot of money."

Hertzog was grinning down at her bare shoulders, his nose crinkling pleasantly. "Lovely perfume, Miss."

"Why, thank you!"

"My name's Frank Hertzog.

Founder and sole President, International Tours, Incorporated."

"Why, my goodness, you took me to Fiji last winter!"

"Did I, now?" Hertzog said with a lively gleam in his eyes.

"Oh, you know what I mean!" the blond girl said with a flustered tap of her fingers against his arm. "I mean, I was a customer of yours!"

"Nearly everybody in Atlantis has been, at one time or another. I'm only sorry now that I haven't been able to give all our clients my personal attention. Will you have a drink with me, Miss?"

"Thank you, I'd love it!" She laughed throatily. "And my name's Paulette Brighton."

"Pleased to meet you, Paulette, I'm sure," Hertzog murmured, signaling to a waiting servitor.

They touched the rims of their glasses and sipped, Hertzog's eyes laughing down at her, and she with her lips pursed enigmatically. Both of them ignored the waiting crowd around the craps table, until they had finished their drinks. Then Hertzog said, "Well, shall we continue where I left off?" He scooped up the dice and shook them vigorously. "Wish me luck?" he smiled at Paulette.

"Oh, sure!" she exclaimed. Then her eyes widened as he continued to shake the dice. "Are you going to bet it *all*?"

"Sure." He glanced across the table at the stickman. "House cover it?"

The pale-skinned, lean and self-possessed man nodded. "House covers anything, Mr. Hertzog."

"Good enough." He threw the dice out with a flip of his fingers. There was a gasp from the crowd. Hertzog grinned down at the dice. "Snake eyes. What do you know."

The stickman hesitated for a fraction of a second, then began pulling in the lost chips. "That was a very fluky roll," he said softly, under the noise of the babbling crowd.

"They're all fluky, friend," Hertzog rejoined. He threw a thousand across the table. "Thanks for a good time, chum. See you again." He turned to Paulette with a smile. "Will you join me at my table?"

She was staring at the raked-in chips unbelievingly. She turned to Hertzog. "Don't you care?"

"For Pete's sake, no, of course not!" he laughed. "Come on—I'll buy you another drink." Taking her arm, he steered her toward the tables. "ITI has more money than it knows what to do with."

"And you're ITI," she said. They were among the tables now. "Oh, there's my Uncle Bill!" she exclaimed. "Come on," she said, pulling him in the direction of a broad-jawed blond man with enormous shoulders, who sat quietly at a table and held a brandy glass between his fingertips. "You've got to meet him."

"Looks like," Hertzog murmured agreeably.

The blond man rose easily to his feet as Paulette introduced them. "Frank, this is William Waring.

Uncle Bill, I'd like you to meet Frank Hertzog."

The blond man's grip was sure and strong. His smile was smooth. "Delighted to meet you, Mr. Hertzog. I've been watching you at the gaming tables. You seem to be a man after my own heart."

Hertzog grinned foolishly. "Pleased to meet you, Uncle Bill." He dropped quickly into an empty chair. "Hoo!" he said, rubbing a hand over his eyes and chuckling weakly. " 'Scuse me, but it's beginning to get me." He brightened. "I know how to fix that! I think we should all have another drink."

"By all means, Mr. Hertzog," Waring murmured. Paulette sat down next to Hertzog and snuggled her shoulder against his. The waiting servitor came forward with his tray.

William Waring glanced at his wrist watch. "I can hardly believe we have been talking here for over an hour already. You're a fascinating conversationalist, Mr. Hertzog."

Hertzog lolled back in his chair. "Sure. Sure," he mumbled. "Call me Frank, huh?"

"Of course, Frank. Then you're agreed with me that the future of Atlantis depends on expansion to the continental areas?"

Hertzog patted Paulette's hand, where it rested on his forearm. " 'Bsolutely. The only thing."

"I knew you were an intelligent man the moment I laid eyes on you." Waring smiled heartily. He looked around at the emptying room. "It seems a pity to break up this party so early. Why don't we move on to my diggings?"

Paulette tugged at Hertzog's arm, and put her lips close to his ear. "Why don't we do that, Frank?"

Hertzog gestured extravagantly. "Fine by me."

"Good!" Waring pushed his chair back. "Shall we go, then?"

A quick servitor sprang forward to help Hertzog with his chair. Hertzog grinned at him. "Thanks, ol' buddy." He fished in his wallet and pressed a bill on the man.

Paulette giggled. "It's like water with you, isn't it?"

"What," Hertzog asked, "money? Look, Gorgeous, you know what we are, here in Atlantis? We're the happiest, most prosperous, most carefree people that ever walked the Earth. What we have here is happiness. Money won't buy it. It makes money —or whatever else you want. That's the way to live. Happy. You know how many billions of people have died in this world without ever having that for a solitary second in their lives?" He broke off into a slurred laugh. "Lis'n to me, huh?" He linked arms with Paulette. "C'mon, Sweetheart." Then he stopped and smiled archly. "Wups. 'Scuse me a minute. Phone call."

"Have you got a dime?" Paulette giggled.

Waring's apartment was half a floor of a building, with a cantilever balcony that jutted out in a wide sweep over the distant water. Sitting

on the living-room lounge, leaning back against the cushions with a glass in one hand and his other arm around Paulette's waist, Hertzog could see the beginnings of sunrise over Europe even while the foaming ocean remained lost in darkness. "Gorgeous place, Bill. Terrific."

"Thank you," Waring said dryly. A great deal of his charm had evaporated once they had come up the chute from the landing stage. "We were speaking about investments."

"Yeah, sure. Go on." Hertzog tugged, peevishly and with half his attention, at Paulette's waist. She did not seem to be as yielding as she had before.

Waring lit a cigarette with precise motions of his well-kept hands. "We were speaking about my investment syndicate."

"Oh, yeah." Hertzog nodded. " 'Remember, now. You wan' me to let you manage my money. You're gonna have pull with the new City Council."

Waring nodded. "Exactly. Once we begin moving into the continental areas, there'll be fortunes waiting to be made. Every dollar of capital will be multiplied dozens of times over. I need every cent I can lay my hands on." He looked sharply at Hertzog. "You'll be given bonds for your investment, of course. Bonds at an extremely attractive rate of interest."

"Sure, sure," Hertzog said. "I figured that."

"You listen to Uncle Bill, Frankie," Paulette murmured, pressing against him once more before she withdrew. "He knows what he's doing. Your money'll be a lot more valuable in his hands than going over a craps table."

"I don' know," Hertzog said slowly. "I don' see why I have to give it to somebody else. Why don' I jus' form a syndicate of my own, now I know the new City Council's gonna 'courage 'spanshion?"

Waring glanced at Paulette. He sighed without resignation. "All right, Hertzog, I'll tell you why," he said crisply. He crossed the room and took the drink out of Hertzog's hand. "Sober up and listen!"

"Wh—?"

Paulette slipped out of Hertzog's arm. Waring slapped Hertzog lightly across the face. "Are you listening?"

Hertzog nodded, looking from Paulette to Waring. " 'Kay. Listening."

"All right." Waring was poised directly in front of Hertzog. "Because I'll break you if you try it. I'll run you and ITI into the ground. No matter how big you are, my syndicate is bigger. You wouldn't have a chance. You'd be a pauper in no time. You wouldn't like that, would you? No more of that money you like to throw away." Waring laughed. "You oaf! A syndicate of your own! But don't try it, Hertzog—I'm warning you. I've broken people before."

"Never get away with it," Hertzog mumbled. "Have you 'rested f'r conspiracy."

"You won't do that, either," Paulette said coldly. "Tell him, Honey," she said to Waring.

"You see this?" Waring asked Hertzog, taking something out of his breast pocket.

"Piece of straw."

"Exactly. If you try to expose me to anyone, Hertzog, they'll find you floating in the ocean with this in your pocket. Don't threaten me with letters left in a safe place to be opened after your death. Don't threaten me with anything, Hertzog. I've got most of the police force in my pocket already. And no matter what happens to me, you'll be dead first. Dead, and torn up before you die. Remember that, Hertzog. Life's precious."

"You must have a lot of people scared of that piece of straw, Waring," Hertzog said. Something about the way he said it made Paulette put a delicately groomed hand up to her cheek and stare at him curiously. It made Waring frown and take out a pistol, which Hertzog ignored.

"Poor old Arkady Bliss, for example," Hertzog went on. He had gradually altered his posture on the couch so that he was sitting straight and relaxed. "You broke him down to the point where he tried to defraud ITI for getaway money. Then you had his pockets picked for the cash. You stranded him here, so beat down that he isn't even trying to run any more. It's no fault of his own that he hasn't killed himself. But he never told me a thing, Waring. All because of a piece of straw. A terror-symbol. Plant it on a few corpses, and after that you can use it for an iron control."

Hertzog lounged back and smiled at Waring in a way that was a great deal different from his spendthrift grin.

"Let me tell you about ITI, Waring. I built it, out of what I learned from my father's job with a little one-lung agency, and I made it big. Not because I ever thought of using it to control anything, but because I wanted the business. It just grew, and one day I had a monopoly. Well, we give fair service.

"The thing about a big travel agency, chum, is it's got to give complete service. Transportation, accommodations, lodging, food, and financing. There isn't much that goes on in this town that I don't know about. I've got contacts at every hotel and bistro. Got to. I arrange letters of credit. I sell travelers' checks. Got to. I never planned it that way, Uncle Bill, but I know who's going to skip a vacation because he can't afford it, and, vice versa, I know who can afford a bigger one this year.

"Furthermore, chum, when it's money and credit you deal in, you need a staff of special agents to investigate what happens to it when it goes wrong somewhere. I'll bet you cookies to cookie-cutters I've got a police force ten times bigger than what Atlantis has. In fact, the only thing I didn't know about all of this hanky-panky was who you were."

"Paulette!" Waring rapped out, "Signal Fletcher—quickly!"

"Too late, Buster," Hertzog said. "Sad to say, you're up it. Any bully-boys you've got scattered through this

building are too busy to answer signals." He threw one of the heavy foam bolsters into Paulette's midriff, and twisted up out of the lounge. Then he punched Waring cleanly on the jaw, scooping up his gun and throwing it into the ocean.

"And that, Uncle Bill," he said as he heard a special agent finally break through the lock in the elevator door, "was not for slapping me. I needed it. I'm drunk as a skunk. I hit you for the hangover I'm going to have."

Frank Hertzog stood at his office window, his hands in his pockets, and rocked forward on his toes. He looked out over the sea and the city, and after a while he chuckled. "I guess it'll hold itself up for a while longer," he said, and turned back toward his desk, where Hoke Bannister was sitting on one edge and lighting a clear Havana cigar from a platinum case.

"Darned right I'm going to sue Waring for conspiracy to defraud. Twenty thousand dollars in damages, and a hundred thousand recovery costs." He stalked back toward the desk. "Imagine the nerve of the guy," he said indignantly, picking up the phone. "Get me the Legal Department. Trying to mess around like that in my home town."

THE END

IN TIMES TO COME

If one man says to another, "I've been looking for you . . ." there can be considerable question as to just what he means. If he says that and pulls out a gun simultaneously, there's much less question of meaning, of course.

Murray Leinster has a yarn coming up next month, entitled "The Aliens." The Aliens were looking for Mankind; they'd been looking for them on a thousand planets, and the trace of their looking had been found. And then a human ship finally found the Aliens, and learned just precisely what the Aliens had been so earnestly seeking Mankind for . . .

THE EDITOR.

THE UNARTIFICIAL ELEMENTS

BY ISAAC ASIMOV

***Neptunium** and Plutonium, Technitium and several other elements were first discovered in atomic reactors. But...they do occur in nature, you know! So what's an "artificial" element?*

OF ALL the elements nobody ever heard of twenty years ago, certainly the most famous is plutonium.

It wasn't the first element to be artificially produced in the laboratory. That honor belongs to element number 43, which was first produced in 1937 by the bombardment of its neighbor, molybdenum—element number 42—with deuterons—the nuclei of heavy hydrogen atoms. Element number 43, received the name, technetium, from the Greek word "technetos" meaning "artificial."

Then, in 1940, when everybody was bombarding uranium—element number 92—with neutrons, it turned out that the common uranium isotope, uranium-238—to be distinguished from its fissionable relative, uranium-235—would occasionally absorb a neutron and become uranium-239. Now uranium-239 is highly unstable, having a half life of twenty-three minutes. (That is, half of it breaks down in that interval, half the remainder breaks down in another such interval and so on.) It breaks down by emitting an electron. This converts it to the element one higher up, element number 93, which was named neptunium. This was the second new element to be prepared artificially. The particular isotope so obtained was neptunium-239.

But neptunium-239 is quite un-

stable, too, and has a half life of two point thirty-one days. It emits an electron and is converted to element number 94, which was named plutonium. Plutonium was thus the third element to be prepared artificially.

However, plutonium-239 — the particular isotope prepared—has a half life of 24,200 years. It breaks down, yes, but not perceptibly in one man's lifetime. This means that it accumulates. When uranium-238 is bombarded with neutrons, those atoms that absorb the neutrons race through the uranium-239 and neptunium-239 stages and settle down comfortably as plutonium-239.

What makes plutonium remarkable, then, is that it can be prepared in large quantities. Some artificial elements are curiosities that coat the bottoms of small test tubes held under magnifying glasses. Not plutonium. It was made in pound lots and, I strongly suspect, tons of it may now exist on Earth. Certainly, there is enough to serve as fuel for atom bombs and even for several experimental nuclear power plants that have been set up. (Plutonium-239, like uranium-235, will undergo fission when bombarded with slow neutrons.)

So plutonium is man's prize example of an artificial element prepared in quantity.

But is plutonium really artificial? What happens in the laboratory may happen in nature, too. There is uranium-238 in the soil and what if there are free neutrons floating around, too? An obvious source of such free neutrons is the cosmic ray bombardment of the atmosphere which knocks neutrons out of atoms very handily. However, free neutrons have a half life of only thirteen minutes—breaking up into protons and electrons—and it might be questionable whether very many could find their way into the soil.

However, there's another source of neutrons, the uranium itself. Every once in a while, a uranium-238 atom will fission spontaneously. This is a rare occurrence. The half life of uranium-238 as far as ordinary alpha-particle breakdown is concerned is four and one half billion years. The half life of its spontaneous fission is 6,000,000 billion years, 1,300,000 times longer than the half life of alpha-particle emission.

The number of uranium atoms fissioning spontaneously is related to the number emitting alpha particles —in the same time—in inverse ratio to the respective half lives. In a pound of uranium there are 5,500,000 breakdowns by alpha-particle emissions each second, and the number of breakdowns by spontaneous fission are as many fewer as the half life is longer. There are 5,500,000/1,300,000 or four and one quarter spontaneous fissions each second.

Still, there are plenty of atoms of uranium in the crust and the number of fissions per second mounts up. And every time, a uranium-238 atom fissions, two or three neutrons

are liberated and plunge through the atoms in the immediate vicinity —which always include, of course, a vast number of other uranium-238 atoms.

Well, then, given uranium-238 atoms and speeding neutrons, there is bound, every once in a while, to be a meeting of the two and the formation of an atom of uranium-239. It must then follow, as the night the day—only faster on the average — that neptunium-239 is formed. Then, it follows, as the day the night—but a trifle more slowly on the whole—that plutonium-239 is formed. And there it sits.

It stands to reason, then, that any sample of ore containing uranium must contain plutonium as well, so that plutonium is not, strictly speaking, an artificial element, but one that occurs naturally.

Suspecting this, plutonium was searched for in uranium minerals and, in 1942, found. Not much, to be sure. So little, in fact, that if it weren't for its telltale radioactivity, it could never have been detected. On the average, it turns out that for every hundred trillion atoms of uranium in the Earth's crust, there is one plutonium atom.

Now the richest pitchblende is about seventy-five percent uranium. Two and a half billion tons of such pitchblende will contain one ounce of plutonium.

In fact, in the Earth's crust as a whole—including the outermost ten miles of the lithosphere, plus the oceans and the air—the fraction by weight of plutonium, is, approximately 0.00000000000000000002 (2×10^{-21}). Since the crust weighs about 4.4×10^{22} pounds altogether the total amount of naturally occurring plutonium in the crust of the Earth amounts to eighty-eight pounds.

But what about other artificial elements? There is an isotope of neptunium, neptunium-237, which has a half life of 2,200,000 years and it, too, is formed by a series of nuclear reactions that begins when uranium-238 absorbs a neutron. The reactions, naturally, follow a course different from those producing plutonium-239.

Neptunium-237, with a longer half life than plutonium-239, accumulates to higher concentrations in uranium, two hundred times higher in fact. There is, therefore, nearly nine tons of naturally-occurring neptunium in the Earth's crust.

Even nine tons isn't much spread over the entire crust of a respectably-large planet, but still it's there. When chemists decide that an element occurs naturally they don't set up admission requirements depending on quantity.

So if anyone asks you what is the most complicated naturally-occurring variety of atom, don't say uranium. You'd be wrong.

Consider the light elements. There are two, element number 43—technetium, and already mentioned—and

element number 61—promethium —which have no stable isotopes. They don't even have any long-lived unstable isotopes. The longest-lived technetium isotope has a half life of 200,000 years, which isn't long enough for independent life all during the five billion years that Earth has existed. The longest-lived promethium isotope has a half life of two and one half years which isn't worth discussing. Nor is either formed by the way of the usual breakdowns of either uranium or thorium, which breakdowns are responsible for the natural occurrence of such rare elements as radium, polonium, francium and astatine. The only conclusion seems to be that technetium and promethium can't exist on Earth—at all!

But that's wrong. Both *are* formed as products of uranium fission! As I've said, uranium fission proceeds spontaneously—at a rate that is exceedingly slow, to be sure, but greater than zero, nevertheless. So there must be at least a little naturally-occurring technetium and and promethium in the soil; an atom or two, here or there, you know.

Yet the very name, "technetium" advertises the fact that it is "artificial." So what is an artificial element, anyway?

Is it one that is entirely man-made and doesn't exist naturally on Earth at all? In that case, is *any* element artificial? Certainly, neptunium and plutonium aren't.

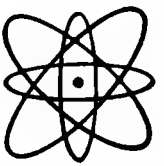
Is it one that is man made, regardless of whether it also exists naturally on Earth? In that case, all elements without exception are artificial, since some of each have been manufactured in the laboratory.

Is it one that now exists in greater man made quantity than exists naturally? In that case, plutonium is almost certainly artificial, but neptunium is just as certainly not artificial.

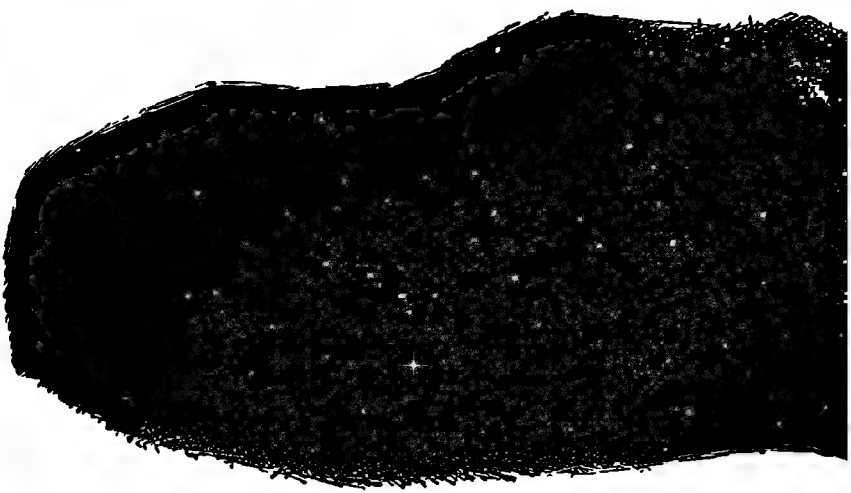
Is it one that was man made before it was discovered in nature? In that case, neptunium and plutonium are both artificial. However, francium—element number 87—which exists naturally in the Earth's crust in lesser quantities than either neptunium or plutonium is nevertheless not artificial, since it was discovered in nature before it was man made.

In short, in speaking of "artificial elements" as in speaking of almost anything else in science, it is difficult to make hard and fast statements. (I should say "impossible" rather than "difficult" but I hesitate to make this statement hard and fast, either.)

THE END



DORSAI!



BY GORDON R. DICKSON

Illustrated by van Dongen

Conclusion. And now Donal, it's all yours! The whole universe! But ...you can't give it away, can you...

SYNOPSIS

"The boy's odd. You never know which way he'll jump."

This is the considered opinion of his family and military instructors about DONAL GRAEME, *on the small world of the* Dorsai—*a planet the chief export of which is professional soldiers, one of whom Donal has just become with graduation from a military academy on his eighteenth birthday.*

It is an opinion in which Donal concurs, but not happily. The reasons which impel him to do things are ones which he has never been successful in explaining to other people. In addition, he is troubled by deep desires and insights which he cannot explain even to himself. Militarily brilliant, he is still like a stranger passing through a town, the ways of whose people are different; and who look on him with a lack of understanding amounting to suspicion.

He has come to his majority at a time of particular unrest between the stars. It is the year 2403. Man has spread out to inhabit seven other star systems beside the Solar. The occupied planets—nearly all of them terraformed to some degree or other—are: In the Solar System, Earth *and her* Moon, Mars *and* Venus; *in Alpha Centauri,* Newton, *and* Cassida; *in the system of Sirius, the planets* New Earth, Freiland, *and the largely useless small world of* Oriente; *in the system of Tau Ceti, the large, low-gravity world of* Ceta; *in the Procyon system the so-called* Exotic Worlds *of* Mara *and* Kultis, *the Catholic planet of* St. Marie, *and the mining world called* Coby; *in E. Eridani the twin planets of* Association *and* Harmony, *ironically referred to as* The Friendly Worlds, *or* The Friendlies; *the small fisher planet of* Dunnin's World *in the system of Altair; and under the star, Fomalhaut, Donal's native world, known as* The Dorsai.

The lifeblood of these worlds is the skill of their trained specialists—and the medium of trade between the worlds is the exchange of work contracts where a specialist in one field may be hired out in order that another specialist of a type the home world needs may be imported and employed. In the past two hundred years the inhabited planets have developed their own particular characters and special schools. Earth exports specialists in the social sciences and education. Mars, weather and agricultural experts. Venus, and her daughter technocratic worlds of Newton and Cassida, specialists in the hard sciences and their corresponding technologies. New Earth and Freiland, under their monarchial republics, export construction and legal experts, and some professional soldiers. Mara and Kultis export specialists in the medical and psychological sciences. The Friendlies export theologians in some small number, and machine-design specialists. St. Marie, Dunnin's World, and Coby export little except indentured students, whose contract rights have to be split with the world that educates them—these worlds being too poor and

young to have developed any home schools worth mentioning. Ceta exports mercantile and business experts of the highest skill. The Dorsai exports only professional soldiers—but these of such fine quality that there is always a hungry market for their contractual services.

Donal, who is the product of the best of Dorsai breeding and training —and who, in addition has some of *the best of the Exotic Maran genes in his ancestry—lacks nothing of the ability of the perfect mercenary soldier. His psychological make-up, however, is complicated by powerful emotions and perceptions he himself does not understand; and by an inability of his to make the reasons for which he does things understandable to other people. The day of his eighteenth birthday he feels the pull of a vast and formless need for something that he resists without understanding. Later that night, in his first experience with liquor, he becomes drunk while at dinner with his father* EACHAN KHAN GRAEME, *his twin uncles,* IAN *and* KENSIE, *and his older brother,* MOR. *Intoxicated, he cries out to the rest of them that he will be the greatest general that ever was, that he'll show the worlds what a Dorsai can be; and he has a momentary vision of the others at the table as not older, stronger, and more experienced, but helpless as children and turning to him for protection.*

Three weeks later, on the spaceship taking him to the Friendlies, where he intends to put his contract up for sale, he is suddenly moved to involve himself with a young girl of his own age, ANEA MARLIVANA, *a special product of Exotic breeding known as the* SELECT *of Kultis. Anea foolishly attempts to hire him to destroy the contract binding her in the service of* WILLIAM, *Prince and Chairman of the Board on Ceta, not knowing such destruction is a physical near-impossibility. Shocked at the involvement in such a situation of a person who represents the finest gene selections and psychological upbringing the Exotic medical science can achieve, Donal ignores her demand and sets out to make his own investigation of the situation.*

He commences by boldly and falsely claiming an acquaintance between his father and another Dorsai, HENDRICK GALT, *Marshal of Freiland. Galt, who sees through the fraud, is intrigued enough to say nothing; with the result that Donal is invited to a dinner party in the ship's dining room, not only with Galt, but with Anea and William—and two young men:* AR DELL MONTOR, *a Newtonian with a genius in the field of social dynamics, but sunk into alcoholism in an attempt to spite William, who owns his contract body and soul, and will not allow him to work; and Commandant* HUGH KILLIEN, *a large and somewhat flashy Freiland career officer, who is Galt's aide.*

During the dinner, Donal causes William to take an interest in him. After, however, in a private session with Galt, Donal informs the marshal that he considers William an absolute devil—and also admits his own im-

posture to gain an introduction, and *his intention of doing something about the Anea-William situation. Astonished and alarmed, Galt—who has taken a liking to Donal—warns him against trying anything at all with William, who is one of the dozen or so most powerful men between the stars. But Donal persists.*

Later, Donal has an interview with William, alone—in which William suddenly strips off his velvet gloves of public politeness and forces Donal to reveal himself as venal and untrustworthy. After showing Donal how easily he could be prosecuted and convicted for theft of Anea's contract—which Donal has just freely given back to him—William turns suddenly pleasant again and promises to find a use for Donal after all, spying upon Anea. Bigger jobs can come later. For the present, William will find Donal a Force-Leadership in Killien's Command, as part of a demonstration field army of Freilander Troops William has under contract, and is leasing to one of the Harmony religious sects.

Leaving William, Donal is confronted by Anea. He admits to her that he offered her contract back to William. She calls him a cheat and a traitor and runs away from him.

Some weeks later, on Harmony, Donal takes part in an action under Hugh Killien. With what Donal considers insufficient forces, they move forward to take up a vacuum on the battle front, around a small enemy Harmony village whose population has been evacuated. That same evening, Donal discovers Hugh slipped away to meet Anea, who is illegally waiting for him in the empty village. Returning to his own Force, barely in time, Donal gets his men up in trees just before the dawn attack of enemy elite troops. The attack is defeated, but at a heavy cost. Hugh emerges from the Village too late to take part in the action; and Donal as senior field officer surviving, orders him arrested and tried by the mercenaries for misleading and abandoning his troops—under Article Four of the Mercenaries Code. Hugh is found guilty and Donal orders him shot on the spot.

Later, discharged from the demonstration forces, Donal faces William's wrath over the execution of Hugh Killien. William, it seems, had plans for Killien. In the end, however, William says he may still find a use for Donal because of the publicity Donal has garnered, following the action. Donal then informs him that he has signed on with Galt for Freiland. Leaving, Donal feels William's cold enmity and suddenly aroused suspicion following him. He pauses in leaving the hotel where William's entourage is staying, only long enough to try to speak to Anea.

Granted a brief interview, he attempts to make Anea understand that Killien was William's tool; and that the only way to protect Anea from the disaster she was courting in her attempts to work against William, was to remove Killien. He can, however, as yet give no satisfactory explanation for William's actions, or

his own success in frustrating them. Anea believes only that Donal had Killien legally murdered to satisfy his own self-seeking purposes—and forces Donal to leave her unconvinced.

Stunned, and unable to understand how someone like Anea, of all people, could be so obtuse; and torn by the self-doubt and loneliness that has always been his lot, Donal goes off to take service under Galt in the forces of Freiland.

Some months later on Freiland, Donal becomes involved with The ELVINE RHY, *a ward and niece-by-marriage of Galt's. Although he enjoys her company, he does not want her; and affairs reach a crisis several months later when Elvine attempts to have Galt hold him out of the forces arming to defend Oriente—which intelligence reports Newton is planning an expeditionary landing upon. Donal goes directly to Galt and gets an appointment as Staff-Liaison officer to a sub-class ship [4].*

In the battle itself that follows above Oriente, the ship is hit, its senior officers casualties, and Donal takes over as acting captain. RUSS LLUDROW, *Galt's Blue Patrol Chief, is encouraged by this to take Donal into his confidence. The Newtonians are using their force on Oriente to bombard Sirius with radiation that is causing dangerous sunspot activity and threatening New Earth and Freiland weather. Their price for withdrawal is a reciprocal trading agreement and an open market on contracts—developments which would create something like a slave market of talent where individuals could be bought and sold without any say in the place or manner of their own employment. This type of trading has always been a favorite of such worlds as Newton, Cassida, Venus, Ceta, the Friendlies—and such others as have a system of government that allows rather less of individual rights. It has been opposed by such worlds as Earth, Mars, New Earth, Freiland, The Exotics, and so forth, up to and including the Dorsai, where individual rights are almost a religious matter. Lludrow admits this to Donal because Donal has earlier suggested a possible counter-threat to the Newtonian forces, consisting of a scare-bombing attempt upon Newton itself.*

Lludrow promotes Donal to captain; and without consulting higher authority, puts him in command of a force of five first-class ships. With these, Donal simulates a bombardment of the Newtonian atmosphere, and puts enough pressure on the Newtonian populace to force the removal of the expeditionary force on Oriente. The psychic shocks resulting from the high number of phase shifts required in the action, however, cause some casualties and put Donal and the men on his ships in the hospital.

Recovered from this and about to be lionized by a party at Galt's residence, back on Freiland, Donal discovers from his orderly, a Cobyman named TAGE LEE, *that William, Anea and the rest are to be present. He goes down to meet them; and finds Anea as implacable against him*

as ever although William is warmly friendly and makes no mention of the past. Talks with Anea and ArDell Montor, however, impel Donal to new action. He seeks out Galt to warn him against leasing any troops to William for releasing purposes; and to ask that Galt release him, Donal, from his contract to Freiland. With the name he has acquired as a result of the Newtonian affair he wishes to take a post as War Chief of the Friendly forces. When Galt taxes him with ambition he admits the older Dorsai is partially right, but mainly, he will find it easier to oppose William as a free agent, unconnected with Galt. Galt is astonished that Donal should continue to think of opposing William—but Donal can answer only that he considers it inevitable that he and William should eventually come into conflict.

Shortly after becoming War Chief of the Friendlies, Donal receives a tape signal from his father back on the Dorsai. Donal's uncle, Kensie, is dead; and Ian, Kensie's twin brother, is in a bad psychological state as a result. Donal's father asks Donal to find a place for Ian on his staff; and asks him also to keep in touch with Donal's older brother, Mor, who—failing to match Donal's meteoric rise in the military firmament—has taken service as far removed from Donal as possible. Mor is, in fact, currently under contract on Ceta, William's home planet — which would put he and Donal on opposite sides in case of an open conflict.

Ian comes to train Donal's new troops; and Donal, by sheathing the grids on his sub-class ships, tricks GENEVE COLMAIN — *Exotics Commander—into an untenable position on the moon of Zombri: and negotiates a peace with the Exotics that allows the Friendlies an observation post on that moon of the Exotic system. Returning to the triumph on Harmony that celebrates his victory, Donal finds an entirely different reception from* ELDEST BRIGHT, *head of the Council of Churches on Harmony and Association. Bright claims Donal sold out in not destroying Colmain's forces when he had them at his mercy; and attempts to arrest Donal for betrayal of his employer. Donal kills the three soldiers ordered to arrest him; and with this arrest attempt as an excuse, breaks his contract.*

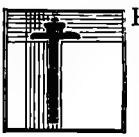
"Go to the Godless, then!" screams Bright. "Go to Mara and Kultis."

Donal acknowledges the Eldest's words.

"Remember, gentlemen," he says, going out. "It was your suggestion."

PART 3

PART-MORON



HERE remained, the interview with Sayona the Bond. Going up some wide and shallow steps into the establishment —it could not be called merely a building, or group of buildings— that housed the most important indi-

vidual of the two Exotic planets, Donal found cause for amusement in the manner of his approach.

Farther out, among some shrubbery at the entrance to the—estate?—he had encountered a tall, gray-eyed woman; and explained his presence.

"Go right ahead," the woman had said, waving him onward. "You'll find him." The odd part of it was, Donal had no doubt that he would. And the unreasonable certainty of it tickled his own strange sense of humor.

He wandered on by a sunlit corridor that broadened imperceptibly into a roofless garden, past paintings, and pools of water with colorful fish in them—through a house that was not a house, in rooms and out until he came to a small sunken patio, half-roofed over; and at the far end of it, under the shade of the half-roof was a tall bald man of indeterminate age, wrapped in a blue robe and seated on a little patch of captive turf, surrounded by a low, stone wall.

Donal went down three stone steps, across the patio, and up the three stone steps at the far side until he stood over the tall, seated man.

"Sir," said Donal. "I'm Donal Graeme."

The tall man waved him down on the turf.

"Unless you'd rather sit on the wall, of course," he smiled. "Sitting cross-legged doesn't agree with everyone."

"Not at all, sir," answered Donal, and sat down cross-legged himself.

"Good," said the tall man; and apparently lost himself in thought, gazing out over the patio.

Donal also relaxed, waiting. A certain peace had crept into him in the way through this place. It seemed to beckon to meditation; and—Donal had no doubt—was probably cleverly constructed and designed for just that purpose. He sat, comfortably now, and let his mind wander where it chose; and it happened—not so oddly at all—to choose to wander in the direction of the man beside him.

Sayona the Bond, Donal had learned as a boy in school, was one of the human institutions peculiar to the Exotics. The Exotics were two planetsful of strange people, judged by the standards of the rest of the human race—some of whom went so far as to wonder if the inhabitants of Mara and Kultis had developed wholly and uniquely out of the human race, after all. This, however, was speculation half in humor and half in superstition. In truth, they were human enough.

They had, however, developed their own forms of wizardry. Particularly in the fields of psychology and its related branches, and in that other field which you could call gene selection or planned breeding depending on whether you approved or disapproved of it. Along with this went a certain sort of general mysticism. The Exotics worshiped no god, overtly, and laid claim to no religion. On the other hand they were nearly all—they claimed, by individual choice—vegetarians and adherents of nonviolence on the ancient Hindu order.

In addition, however, they held to another cardinal nonprinciple; and this one was the principle of noninterference. The ultimate violence they believed, was for one person to urge a point of view on another—in any fashion of urging. Yet, all these traits had not destroyed their ability to take care of themselves. If it was their creed to do violence to no man, it was another readily admitted part of their same creed that no one should therefore be wantonly permitted to do violence to them. In war and business, through mercenaries and middlemen, they more than held their own.

But, thought Donal—to get back to Sayona the Bond, and his place in Exotic culture. He was one of the compensations peculiar to the Exotic peoples, for their different way of life. He was—in some way that only an Exotic fully understood—a certain part of their emotional life made manifest in the person of a living human being. Like Anea, who—devastatingly normal and female as she was—was, to an Exotic, *literally* one of the select of Kultis. She was their best selected qualities made actual—like a living work of art that they worshiped. It did not matter that she was not always joyful, that indeed, her life must bear as much or more of the normal human sorrow of situation and existence. That was where most people's appreciation of the matter went astray. No, what was important was the capabilities they had bred and trained into her. It was the capacity in her for living, not the life she actually led, that pleasured them. The actual achievement was up to her, and was her own personal reward. They appreciated the fact that—if she chose, and was lucky—she could appreciate life.

Similarly, Sayona the Bond. Again, only in a sense that an Exotic would understand, Sayona was the actual bond between their two worlds made manifest in flesh and blood. In him was the capability for common understanding, for reconciliation, for an expression of the community of feeling between people . . .

Donal awoke suddenly to the fact that Sayona was speaking to him. The older man had been speaking some time, in a calm, even voice, and Donal had been letting the words run through his mind like water of a stream through his fingers. Now, something that had been said had jogged him to a full awareness.

". . . Why, no," answered Donal, "I thought this was standard procedure for any commander before you hired him."

Sayona chuckled.

"Put every new commander through all that testing and trouble?" he said. "No, no. The word would get around and we'd never be able to hire the men we wanted."

"I rather enjoy taking tests," said Donal, idly.

"I know you do," Sayona nodded. "A test is a form of competition, after all; and you're a competitor by nature. No, normally when we want a military man we look for military

proofs like everyone else—and that's as far as we go."

"Why the difference with me, then?" asked Donal, turning to look at him. Sayona returned his gaze with pale brown eyes holding just a hint of humor in the wrinkles at their corners.

"Well, we weren't just interested in you as a commander," answered Sayona. "There's the matter of your ancestors, you know. You're actually part-Maran; and those genes, even when outmatched, are of interest to us. Then there's the matter of you, yourself. You have astonishing potentials."

"Potentials for what?"

"A number of rather large things," said Sayona soberly. "We only glimpse them, of course, in the results of our tests."

"Can I ask what those large things are?" asked Donal, curiously.

"I'm sorry, no. I can't answer that for you," said Sayona. "The answers would be meaningless to you, personally, anyway—for the reason you can't explain anything in terms of itself. That's why I thought I'd have this talk with you. I'm interested in your philosophy."

"Philosophy!" Donal laughed. "I'm a Dorsai."

"Everyone, even Dorsai, every living thing has its own philosophy—a blade of grass, a bird, a baby. An individual philosophy is a necessary thing, the touchstone by which we judge our own existence. Also—you're only part Dorsai. What does the other part say?"

Donal frowned.

"I'm not sure the other part says anything," he said. "I'm a soldier. A mercenary. I have a job to do; and I intend to do it—always—in the best way I know how."

"But beyond this—" urged Sayona.

"Why, beyond this—" Donal fell silent, still frowning. "I suppose I would want to see things go well."

"You said want to see things go well—rather than *like* to see things go well." Sayona was watching him. "Don't you see any significance in that?"

"Want? Oh—" Donal laughed. "I suppose that's an unconscious slip on my part. I suppose I was thinking of *making* them go well."

"Yes," said Sayona, but in a tone that Donal could not be sure was meant as agreement or not. "You're a doer, aren't you?"

"Someone has to be," said Donal. "Take the civilized worlds now—" he broke off suddenly.

"Go on," said Sayona.

"I meant to say—take civilization. Think how short a time it's been since the first balloon went up back on Earth. Four hundred years? Five hundred years? Something like that. And look how we've spread out and split up since then."

"What about it?"

"I don't like it," said Donal. "Aside from the inefficiency, it strikes me as unhealthy. What's the point of technological development if we just split in that many more factions—everyone hunting up his own type of aberrant mind and hiving with it? That's no progress."

"You subscribe to progress?"

Donal looked at him.

"Don't you?"

"I suppose," said Sayona. "A certain type of progress. *My* kind of progress. What's yours?"

Donal smiled.

"You want to hear that, do you? You're right. I guess I do have a philosophy after all. You want to hear it?"

"Please," said Sayona.

"All right," said Donal. He looked out over the little sunken garden. "It goes like this—each man is a tool in his own hands. Mankind is a tool in *its* own hands. Our greatest satisfaction doesn't come from the rewards of our work, but from the working itself; and our greatest responsibility is to sharpen, and improve the tool that is ourselves so as to make it capable of tackling bigger jobs." He looked at Sayona. "What do you think of it?"

"I'd have to think about it," answered Sayona. "My own point of view is somewhat different, of course. I see Man not so much as an achieving mechanism, but as a perceptive link in the order of things. I would say the individual's role isn't so much to *do* as it is to *be*. To realize to the fullest extent the truth already and inherently in him—if I make myself clear."

"Nirvana as opposed to Valhalla, eh?" said Donal, smiling a little grimly. "Thanks, I prefer Valhalla."

"Are you sure?" asked Sayona.

"Are you quite sure you've no use for Nirvana?"

"Quite sure," said Donal.

"You make me sad," said Sayona, somberly. "We had had hopes."

"Hopes?"

"There is," said Sayona, lifting one finger, "this possibility in you—this great possibility. It may be exercised in only one direction—that direction you choose. But you have freedom of choice. There's room for you here."

"With you?"

"The other worlds don't know," said Sayona, "what we've begun to open up here in the last hundred years. We are just beginning to work with the butterfly implicit in the matter-bound worm that is the present human species. There are great opportunities for anyone with the potentialities for this work."

"And I," said Donal, "have these potentialities?"

"Yes," answered Sayona. "Partly as a result of your Maran genes, partly as a result of a lucky genetic accident that is beyond our knowledge to understand, now. Of course—you would have to be retrained. That other part of your character that rules you now would have to be readjusted to a harmonious integration with the other part *we* consider more valuable."

Donal shook his head.

"There would be compensations," said Sayona, in a sad, almost whimsical tone, "things would become possible to you—do you know that you, personally, are the sort of man who, for example, could walk on air if only you believed you could?"

Donal laughed.

"I am quite serious," said Sayona. "Try believing it some time."

"I can hardly try believing what I instinctively disbelieve," said Donal. "Beside, that's beside the point. I am a soldier."

"But what a strange soldier," murmured Sayona. "A soldier full of compassion, of whimsical fancies and wild daydreams. A man of loneliness who wants to be like everyone else; but who finds the human race a conglomeration of strange alien creatures whose twisted ways he cannot understand—while still he understands them too well for their own comfort."

He turned his eyes calmly onto Donal's face, which had gone set and hard.

"Your tests *are* quite effective, aren't they?" Donal said.

"They are," said Sayona. "But there's no need to look at me like that. We can't use them as a weapon, to make you do what we would like to have you do. That would be an action so self-crippling as to destroy all its benefits. We can only make the offer to you." He paused. "I can tell you that on the basis of our knowledge we can assure you with better than fair certainty that you'll be happy if you take our path."

"And if not?" Donal had not relaxed.

Sayona sighed.

"You are a strong man," he said.

"Strength leads to responsibility, and responsibility pays little heed to happiness."

"I can't say I like the picture of myself going through life grubbing after happiness." Donal stood up. "Thanks for the offer, anyway. I appreciate the compliment it implies."

"There is no compliment in telling a butterfly he is a butterfly and need not crawl along the ground," said Sayona.

Donal inclined his head politely.

"Good-by," he said. He turned about and walked the few steps to the head of the shallow steps leading down into the sunken garden and across it to the way he had come in.

"Donal—" The voice of Sayona stopped him. He turned back and saw the Bond regarding him with an expression almost impish. "*I* believe you can walk on air," said Sayona.

Donal stared; but the expression of the other did not alter. Swinging about, Donal stepped out as if onto level ground—and to his unutterable astonishment his foot met solidity on a level, unsupported, eight inches above the next step down. Hardly thinking why he did it, Donal brought his other foot forward into nothingness. He took another step—and another. Unsupported on the thin air, he walked across above the sunken garden to the top of the steps on the far side.

Striding once more onto solidity, he turned about and looked across the short distance. Sayona still regarded him; but his expression now was unreadable. Donal swung about and left the garden.

Very thoughtful, he returned to his own quarters in the city of Portsmouth, which was the Maran city holding the Command Base of the Exotics. The tropical Maran night had swiftly enfolded the city by the time he reached his room, yet the soft illumination that had come on automatically about and inside all the buildings by some clever trick of design failed to white-out the overhead view of the stars. These shone down through the open wall of Donal's bedroom.

Standing in the center of the bedroom, about to change for the meal which would be his first of the day—he had again forgotten to eat during the earlier hours—Donal paused and frowned. He gazed up at the gently domed roof of the room, which reached its highest point some twelve feet above his head. He frowned again and searched about through his writing desk until he found a self-sealing signal-tape capsule. Then, with this in one hand, he turned toward the ceiling and took one rather awkward step off the ground.

His foot caught and held in air. He lifted himself off the floor. Slowly, step by step he walked up through nothingness to the high point of the ceiling. Opening the capsule, he pressed its self-sealing edges against the ceiling, where they clung. He hung there a second in air, staring at them.

"Ridiculous!" he said suddenly—

and, just as suddenly, he was falling. He gathered himself with the instinct of long training in the second of drop and, landing on hands and feet, rolled over and came to his feet like a gymnast against a far wall. He got up, brushing himself off, unhurt—and turned to look up at the ceiling. The capsule still clung there.

He lifted the little appliance that was strapped to his wrist and keyed its phone circuit in.

"Lee," he said.

He dropped his wrist and waited. Less than a minute later, Lee came into the room. Donal pointed toward the capsule on the ceiling. "What's that?" he asked.

Lee looked.

"Tape capsule," he said. "Want me to get it down?"

"Never mind," answered Donal. "How do you suppose it got up there?"

"Some joker with a float," answered Lee. "Want me to find out who?"

"No—never mind," said Donal. "That'll be all."

Bending his head at the dismissal, Lee went out of the room. Donal took one more look at the capsule, then turned and wandered over to the open wall of his room, and looked out. Below him lay the bright carpet of the city. Overhead hung the stars. For longer than a minute he considered them.

Suddenly he laughed, cheerfully and out loud.

"No, no," he said to the empty room. "I'm a Dorsai!"

He turned his back on the view and went swiftly to work at dressing for dinner. He was surprised to discover how hungry he actually was.

PROTECTOR

Battle Commander of Field Forces Ian Ten Graeme, that cold, dark man, strode through the outer offices of the Protector of Procyon with a *private-and-secret* signal in his large fist. In the three outer offices, no one got in his way. But at the entrance to the Protector's private office, a private secretary in the green-and-gold of a staff uniform ventured to murmur that the Protector had left orders to be undisturbed. Ian merely looked at her, placed one palm flat against the lock of the inner office door—and strode through.

Within, he discovered Donal standing by an open wall, caught by a full shaft of Procyon's rich-yellow sunlight, gazing out over Portsmouth and apparently deep in thought. It was a position in which he was to be discovered often, these later days. He looked up now at the sound of Ian's measured tread approaching.

Six years of military and political successes had laid their inescapable marks upon Donal's face, marks plain to be seen in the sunlight. At a casual glance he appeared hardly older than the young man who had left the Dorsai half a dozen years before. But a closer inspection showed him to be slightly heavier of build now—even a little taller. Only this extra weight, slight increase as it was, had not served to soften the clear lines of his

features. Rather these same features had grown more pronounced, more hard of line. His eyes seemed a little deeper set now; and the habit of command—command extended to the point where it became unconscious—had cast an invisible shadow upon his brows, so that it had become a face men obeyed without thinking, as if it was the natural thing to do.

"Well?" he said, as Ian came up.

"They've got New Earth," his uncle answered; and handed over the signal tape. "Private-and-secret to you from Galt."

Donal took the tape automatically, that deeper, more hidden part of him immediately taking over his mind. If the six years had wrought changes upon his person and manner, they had worked to even greater ends below the surface of his being. Six years of command, six years of estimate and decision had beaten broad the path between his upper mind and that dark, oceanic part of him, the depthless waters of which lapped on all known shores and many yet unknown. He had come—you could not say to terms—but to truce with the source of his oddness; hiding it well from others, but accepting it to himself for the sake of the tool it placed in his hands. Now, this information Ian had just brought him was like one more stirring of the shadowy depths, a rippled vibration spreading out to affect all, integrate with all—and make even more clear the vast and shadowy ballet of purpose and counter-purpose that was behind all living action; and—for himself—a call to action.

As Protector of Procyon, now responsible not only for the defense of the Exotics, but of the two smaller inhabited planets in that system—St. Marie, and Coby—that action was required of him. But even more; as himself, it was required of him. So that what it now implied was not something he was eager to avoid. Rather, it was due, and welcome. Indeed, it was almost too welcome—fortuitous, even.

"I see—" he murmured. Then, lifting his face to his uncle, "Galt'll need help. Get me some figures on available strength, will you Ian?"

Ian nodded and went out, as coldly and martially as he had entered.

Left alone, Donal did not break open the signal tape immediately. He could not now remember what he had been musing about when Ian entered, but the sight of his uncle had initiated a new train of thought. Ian seemed well, these days—or at least as well as could be expected. It did not matter that he lived a solitary life, and little to do with the other commanders of his own rank, and refused to go home to the Dorsai, even for a trip to see his family. He devoted himself to his duties of training field troops—and did it well. Aside from that, he went his own way.

The Maran psychiatrists had explained to Donal that no more than this could be expected of Ian. Gently, they had explained it. A normal

mind, gone sick, they could cure. The unfortunate thing was that—at least in so far as his attachment to his twin had been—Ian was not normal. Nothing in this universe could replace the part of him that had died with Kensie—had, indeed, *been* Kensie—for the peculiar psychological make-up of the twins had made them two halves of a whole.

"Your uncle continues to live," the psychiatrists had explained to Donal, "because of an unconscious desire to punish himself for letting his brother die. He is, in fact, seeking death—but it must be a peculiar sort of death which will include the destruction of all that matters to him. 'If thy right hand offend thee, cut it off.' To his unconscious, the Ian-Kensie gestalt holds the Ian part of it to blame for what happened and is hunting a punishment to fit the crime. That is why he continues to practice the—for him—morbid abnormality of staying alive. The normal thing for such a personality would be to die, or get himself killed.

"And that is why," they had concluded, "he refuses to see or have anything to do with his wife or children. His unconscious recognizes the danger of pulling them down to destruction with him. We would advise against his being urged to visit them against his will."

Donal sighed. Thinking about it now, it seemed to him strange that the people who had come to group around him had none of them come—really—because of the fame he had won or the positions he could offer them. There was Ian, who had come because the family had sent him. Lee, who had found the supply of that which his own faulty personality lacked—and would have followed if Donal had been Protector of nothing, instead of being Protector of Procyon. There was Lludrow, Donal's now assistant Chief of Staff, who had come to him not under his own free will, but under the prodding of his wife. For Lludrow had ended up marrying Elvine Rhy, Galt's niece, who had not let even marriage impose a barrier to her interest in Donal. There was Genéve bar-Colmain, who was on Donal's staff because Donal had been kind; and because he had no place else to go that was worthy of his abilities. And, lastly, there was Galt, himself, whose friendship was not a military matter, but the rather wistful affection of a man who had never had a son, and saw its image in Donal—though it was not really fair to count Galt who was apart, as still Marshal of Freiland.

And—in contradistinction to all the rest—there was Mor, the one Donal would have most liked to have at his side; but whose pride had driven him to place himself as far from his successful younger brother as possible. Mor had finally taken service with Venus, where in the open market that flourished on that technological planet, he had had his contract sold to Ceta; and now found himself in the pay of Donal's enemy, which would put them on opposite sides if conflict finally came.

Donal shook himself abruptly. These fits of depression that took him lately were becoming more frequent —possibly as a result of the long hours of work he found himself putting in. Brusquely, he broke open the signal from Galt.

Donal:
The news about New Earth will have reached you by this time. The *coup d'etat* that put the Kyerly government in control of the planet was engineered with troops furnished by Ceta. I have never ceased to be grateful to you for your advice against leasing out units to William. But the pattern here is a bad one. We will be facing the same sort of internal attack here through the local proponents of an open exchange for the buying and selling of contracts. One by one, the worlds are falling into the hands of manipulators, not the least of which is William himself. Please furnish us with as many field units as you can conveniently spare.

There is to be a General Planetary Discussion, meeting on Venus to discuss recognition of the new government on New Earth. They would be wise not to invite you; so come anyway. I, myself, must be there; and I need you, even if no other reason impels you to come.

Hendrik Galt
Marshal, Freiland.

Donal nodded to himself. But he did not spring immediately into action. Where Galt was reacting against the shock of a sudden discovery, Donal, in the situation on New Earth, recognized only the revelation of something he had been expecting for a long time.

The sixteen inhabited worlds of the eight stellar systems from Sol to Altair survived within a complex of traded skills. The truth of the matter was that present day civilization had progressed too far for each planet to maintain its own training systems and keep up with progress in the many necessary fields. Why support a thousand mediocre school systems when it was possible to have fifty superb ones and trade the graduates for the skilled people you needed in other areas of learning? The overhead of such systems was tremendous, the number of top men in each field necessarily limited; moreover, progress was more effective if all the workers in one area of knowledge were kept closely in touch with each other.

The system seemed highly practical. Donal was one of the few men of his time to see the trouble inherent in it.

The joker to such an arrangement comes built in to the question—how much is a skilled worker an individual in his own right, and how much is he a piece of property belonging to whoever at the moment owns his contract? If he is too much an individual, barter between worlds breaks down to a series of individual negotiations; and society nowadays could

not exist except on the basis of community needs. If he is too much a piece of property, then the field is opened for the manipulators—the buyers and sellers of flesh, those who would corner the manpower market and treat humanity like cattle for their own gain.

Among the worlds between the stars, this question still hung in argument. "Tight" societies, like the technological worlds of the so-called Venus group—Venus herself, Newton and Cassia—and the fanatic worlds of Harmony and Association, and Coby, which was ruled by what amounted to a criminal secret society —had always favored the piece of property view more strongly than the individual one. "Loose" societies, like the republican worlds of Old Earth, and Mars, the Exotics—Mara and Kultis—and the violently individualistic society of the Dorsai, held to the individual side of the question. In between were the middling worlds—the ones with strong central governments like Freiland and New Earth, the merchandising world of Ceta, the democratic theocracy of St. Marie, and the pioneer, underpopulated fisher-planet of Dunnin's world, ruled by the co-operative society known as the Corbel.

Among the "tight" societies, the contract exchange mart had been in existence for many years. On these worlds, unless your contract was written with a specific forbidding clause, you might find yourself sold on no notice at all to a very different employer—possibly on a completely different world. The advantages of such a mart were obvious to an autocratic government, since the government itself was in a position to control the market through its own vast needs and resources, which no individual could hope to match. On a "loose" world, where the government was hampered by its own built in system of checks from taking advantage of opposing individual employers, the field was open for the sharp practices not only of individuals, but of other governments.

Thus, an agreement between two worlds for the establishment of a reciprocal open market worked all to the advantage of the "tighter" of the two governments—and must inevitably end in the tighter government gaining the lion's share of the talent available on the two worlds.

This, then, was the background for the inevitable conflict that had been shaping up now for fifty years between two essentially different systems of controlling what was essentially the lifeblood of the human race —it's skilled minds. In fact, thought Donal, standing by the open wall—the conflict was here, and now. It had already been under way that day he had stepped aboard the ship on which he was to meet Galt, and William, and Anea, the Select of Kultis. Behind the scenes, the build-up for a final battle had been already begun, and his own role in that battle, ready and waiting for him.

He went over to his desk and pressed a stud, speaking into a grille.

"I want all Chiefs of Staff here

immediately," he said. "For a top-level conference."

He took his finger from the stud and sat down at the desk. There was a great deal to be done.

PROTECTOR II

Arriving at Holmstead the capital city of Venus five days later, Donal went immediately to a conference with Galt in the latter's suite of rooms at Government Hotel.

"There were things to take care of," he said, shaking hands with the older man and sitting down, "or I'd have been here sooner." He examined Galt. "You're looking tired."

The marshal of Freiland had indeed lost weight. The skin of his face sagged a little on the massive bones, and his eyes were darkened with fatigue.

"Politics — politics —" answered Galt. "Not my line at all. It wears a man down. Drink?"

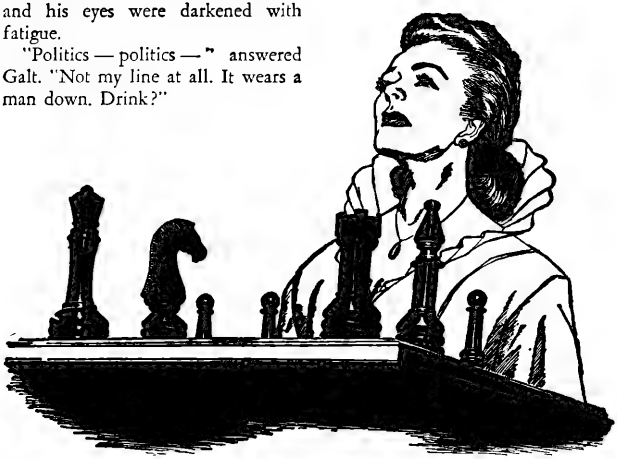
"No thanks," said Donal.

"Don't care for one myself," Galt said. "I'll just light my pipe . . . you don't mind?"

"I never did before. And," said Donal, "you never asked me before."

"Heh . . . no," Galt gave vent to something halfway between a cough an a chuckle; and, getting out his pipe, began to fill it with fingers that trembled a little. "Damned tired, that's all. In fact I'm ready to retire —but how can a man quit just when all hell's popping? You got my message—how many field units can you let me have?"

"A couple and some odds and ends. Say twenty thousand of first-



line troops—" Galt's head came up. "Don't worry," Donal smiled. They will be moved in by small, clumsy stages to give the impression I'm letting you have five times that number, but the procedure's a little fouled up in getting them actually transferred."

Galt grunted.

"I might've known you'd think of something," he said. "We can use that mind of yours here, at the main Conference. Officially, we're gathered here just to agree on a common attitude to the new government on New Earth—but you know what's really on the fire, don't you?"

"I can guess," said Donal. "The open market."

"Right." Galt got his pipe alight; and puffed on it gratefully. "The split's right down the middle, now that New Earth's in the Venus Group's camp and we—Freiland, that is—are clear over on the nonmarket side by way of reaction. We're in fair enough strength counting heads as we sit around the table; but that's not the problem. They've got William—and that white-haired devil Blaine." He looked sharply over at Donal. "You know Project Blaine, don't you?"

"I've never met him. This is my first trip to Venus," said Donal.

"There's a shark," said Galt with feeling. "I'd like to see him and William lock horns on something. Maybe they'd chew each other up and improve the universe. Well . . . about your status here—"

"Officially I'm sent by Sayona the Bond as an observer."

"Well, that's no problem then. We can easily get you invited to step from observer to delegate status. In fact, I've already passed the word. We were just waiting for you to arrive." Galt blew a large cloud of smoke and squinted at Donal through it. "But how about it, Donal? I trust that insight of yours. What's really in the wind here at the Conference?"

"I'm not sure," answered Donal. "It's my belief somebody made a mistake."

"A mistake?"

"New Earth," explained Donal. "It was a fool's trick to overthrow the government there right now—and by force, at that. Which is why I believe we'll be getting it back."

Galt sat up sharply, taking his pipe from his mouth.

"Getting it back? You mean—the old government returned to power?" He stared at Donal. "Who'd give it back to us?"

"William for one, I'd imagine," said Donal. "This isn't *his* way of doing things—piecemeal. But you can bet as long as he's about returning it, he'll exact a price for it."

Galt shook his head.

"I don't follow you," he said.

"William finds himself working with the Venus group right now," Donal pointed out. "But he's hardly out to do them a kindness. His own aims are what concerns him—and it's those he'll be after in the long run. In fact, if you look, I'll bet you see two kinds of negotiations going on at this Conference. The short range, and the long range. The short

range is likely to be this matter of an open market. The long range will be William's game."

Galt sucked on his pipe again.

"I don't know," he said, heavily. "I don't hold any more of a brief for William than you do—but you seem to lay everything at his doorstep. Are you sure you aren't a little overboard where the subject of him is concerned?"

"How can anyone be sure?" confessed Donal, wryly. "I think what I think about William, because—" he hesitated, "if I were in his shoes, I'd be doing these things I suspect him of." He paused. "William's weight on our side could swing the conference into putting enough pressure on New Earth to get the old government back in power, couldn't it?"

"Why—of course."

"Well, then." Donal shrugged. "What could be better than William setting forth a compromise solution that at one and the same time puts him in the opposite camp and conceals as well as requires a development in the situation he desires?"

"Well—I can follow that," said Galt, slowly. "But if that's the case, what's he after? What is it he'll want?"

Donal shook his head.

"I'm not sure," he said carefully. "I don't know."

On that rather inconclusive note, they ended their own private talk and Galt took Donal off to meet with some of the other delegates.

The meeting developed, as these things do, into a cocktail gathering in the lounges of the suite belonging to Project Blaine of Venus. Blaine himself, Donal was interested to discover, was a heavy, calm-looking white-haired man who showed no surface evidences of the character Galt had implied to him.

"Well, what do you think of him?" Galt murmured, as they left Blaine and his wife in the process of circulating around the other guests.

"Brilliant," said Donal. "But I hardly think someone to be afraid of." He met Galt's raised eyebrows with a smile. "He seems too immersed in his own point of view. I'd consider him predictable."

"As opposed to William?" asked Galt, in a low voice.

"As opposed to William," agreed Donal. "Who is not—or, not so much."

They had all this time been approaching William, who was seated facing them at one end of the lounge and talking to a tall slim woman whose back was to them. As Galt and Donal came up, William's gaze went past her.

"Well, Marshal!" he said, smiling. "Protector!" The woman turned around; and Donal found himself face to face with Anea.

If five years had made a difference in the outward form of Donal, they had made much more in that of Anea. She was in her early twenties now, and past the last stages of that delayed adolescence of hers. She had begun now to reveal that rare beauty that would deepen with age and ex-

perience and never completely leave her, even in extreme old age. She was more developed now, than the last time Donal had seen her, more fully woman-formed and more poised. Her green eyes met Donal's indeterminate ones across mere centimeters of distance.

"Honored to see you again," said Donal, inclining his head.

"The honor is mine." Her voice, like the rest of her, had matured. Donal looked past her to William. "Prince!" he said.

William stood up and shook hands, both with Donal and with Galt.

"Honored to have you with us, Protector," he said cheerfully to Donal. "I understand the marshal's proposing you for delegate. You can count on me."

"That's good of you," answered Donal.

"It's good for me," said William. "I like open minds around the Conference table and young minds—no offense, Hendrik—are generally open minds."

"I don't pretend to be anything but a soldier," growled Galt.

"And it's precisely that that makes you dangerous in negotiations," replied William. "Politicians and businessmen always feel more at home with someone who they know doesn't mean what he says. Honest men always have been a curse laid upon the sharpshooter."

"A pity," put in Anea, "that there aren't enough honest men, then, to curse them all." She was looking at Donal.

William laughed.

"The Select of Kultis could hardly be anything else but savage upon us underhanded characters, could you, Anea?" he said.

"You can ship me back to the Exotics, any time I wear too heavily on you," she retorted.

"No, no." William wagged his head, humorously. "Being the sort of man I am, I survive only by surrounding myself with good people like yourself. I'm enmeshed in the world of hard reality—it's my life and I wouldn't have it any other way —but for vacation, for a spiritual rest, I like to glance occasionally over the wall of a cloister to where the greatest tragedy is a blighted rose."

"One should not underestimate roses," said Donal. "Men have died over a difference in their color."

"Come now," said William turning on him. "The Wars of the Roses —ancient England? I can't believe such a statement from you, Donal. That conflict, like everything else, was over practical and property disputes. Wars never get fought for abstract reasons."

"On the contrary," Donal said. "Wars invariably get fought for abstract reasons. Wars may be instigated by the middle-aged and the elderly; but they're fought by youth. And youth needs more than a practical motive for tempting the tragedy of all tragedies—the end of the universe —which is dying, when you're young."

"What a refreshing attitude from a professional soldier!" laughed Wil-

liam. "Which reminds me—I may have some business to discuss with you. I understand you emphasize the importance of field troops over everything else in a world's armed forces —and I hear you've been achieving some remarkable things in the training of them. That's information right down my alley, of course, since Ceta's gone in for this leasing of troops. What's your secret, Protector? Do you permit observers?"

"No secret," said Donal. "And you're welcome to send observers to our training program any time, Prince. The reason behind our successful training methods is the man in charge—my uncle, Field Commander Ian Graeme."

"Ah—your uncle," said William. "I hardly imagine I could buy him away from you if he's a relative."

"I'm afraid not," answered Donal.

"Well, well—we'll have to talk, anyway. By heaven—my glass seems to have got itself empty. Anyone else care for another?"

"No thank you," said Anea.

"Nor I," said Donal.

"Well, I will," Galt said.

"Well, in that case, come along marshal," William turned to Galt. "You and I'll make our own way to the bar." They went off together across the lounge. Donal and Anea were left facing each other.

"So," said Donal, "you haven't changed your mind about me."

"No."

"So much for the fair-mindedness of a Select of Kultis," he said ironically.

"I'm not superhuman, you know!" she flashed, with a touch of her younger spirit. "No," she said, more calmly, "there's probably millions as bad as you—or worse—but you've got ability. And you're a self-seeker. It's that I can't forgive you."

"William's corrupted your point of view," he said.

"At least he makes no bones about being the kind of man he is!"

"Why should there be some sort of virtue always attributed to a frank admission of vice?" wondered Donal. "Besides, you're mistaken. William" —he lowered his voice—"sets himself up as a common sort of devil to blind you to the fact that he is what he actually is. Those who have anything to do with him recognize the fact that he's evil; and think that in recognizing this, they've plumbed the depths of the man."

"Oh?" Her voice was scornful. "What *are* his depths, then?"

"Something more than personal aggrandizement. You who are so close to him, miss what the general mass of people who see him from a distance recognize quite clearly. He lives like a monk—he gets no personal profit out of what he does and his long hours of work. And he does not care what's thought of him."

"Any more than you do."

"Me?" caught by an unexpected amount of truth in this charge, Donal could still protest. "I care for the opinion of the people whose opinion I care for."

"Such as?" she said.

"Well you," he answered, "for one. Though I don't know why."

About to say something, and hardly waiting for him to finish so she could say it, she checked suddenly; and stared at him, her eyes widening.

"Oh," she gasped, "don't try to tell me that!"

"I hardly know why I try to tell you anything," he said, suddenly very bitter; and went off, leaving her where she stood.

He went directly out from the cocktail gathering and back to his own suite, where he immersed himself in work that kept him at his desk until the small hours of the morning. Even then, when he at last got to bed, he did not sleep well—a condition he laid to a walking hangover from the drinks at the cocktail gathering.

His mind would have examined this excuse further—but he would not let it.

PROTECTOR III

". . . A typical impasse," said William, Prince of Ceta. "Have some more of this Moselle."

"Thank you, no," answered Donal. The Conference was in its second week and he had accepted William's invitation to lunch with him in William's suite, following a morning session. The fish was excellent, the wine was imported—and Donal was curious, although so far they had spoken of nothing of real importance.

"You disappoint me," William said, replacing the decanter on the small table between them. "I'm not very strong in the food and drink department myself—but I do enjoy watching others enjoy them." He raised his eyebrows at Donal. "But your early training on the Dorsai is rather Spartan?"

"In some respects, yes," answered Donal. "Spartan and possibly a little provincial. I'm finding myself sliding into Hendrik Galt's impatience with the lack of progress in our talks."

"Well, there you have it," said William. "The soldier loves action, the politician the sound of his own voice. But there's a better explanation than that, of course. You've realized by now, no doubt, that the things that concern a Conference aren't settled at the Conference table"—he gestured with his hand at the food before him—"but at small tete-a-tetes like these."

"I'd guess then that the tete-a-tetes haven't been too productive of agreements so far." Donal sipped at the wine left in his glass.

"Quite right," said William cheerfully. "Nobody really wants to interfere in local affairs on a world; and nobody really wants to impose an institution on it from the outside, such as the open market, against the will of some of its people." He shook his head at Donal's smile. "No, no—I'm being quite truthful. Most of the delegates here would just as soon the problem of an open market had never come up at all on New Earth, so that they could tend to their own

styles of knitting without being bothered."

"I'll still reserve my judgment on that," said Donal. "But in any case, now we're here, we've got to come to some decision. Either for or against the current government; and for or against the market."

"Do we?" asked William. "Why not a compromise solution?"

"What sort of compromise?"

"Well that, of course," said William, in a frank tone, "is why I asked you to lunch. I feel very humble about you, Donal—I really do. I was entirely wrong in my estimate of you, five years ago. I did you an injustice."

Donal lifted his right hand in a small gesture of deprecation.

"No . . . no," said William. "I insist on apologizing. I'm not a kind man, Donal. I'm interested only in buying what others have to sell—and if a man has ability, I'll buy it. If not—" He let the sentence hang significantly. "But you *have* ability. You had it five years ago, and I was too concerned with the situation to recognize it. The truth of the matter is, Hugh Killien was a fool."

"On that, I can agree with you," Donal said.

"Attempting to carry on with Anea under my nose—I don't blame the girl. She was still a child then, for all her size. That's the way these Exotic hothouse people are—slow growing. But I should have seen it and expected it. In fact, I'm grateful to you for what you did, when I think back on it."

"Thank you," murmured Donal.

"No, I mean that absolutely. Not that I'm talking to you now out of a sense of gratitude alone—I wouldn't insult your credulity with such a suggestion. But I am pleased to be able to find things working out in such a way that my own profit combines with the chance to pay you a small debt of gratitude."

"At any rate, I appreciate it," said Donal.

"Not at all. Now, the point is this," said William, leaning forward over the table, "personally, of course, I favor the open market. I'm a businessman, after all, and there's business advantages to perfectly free trading. But more than open markets, its important to business to have peace between the stars; and peace comes only from a stable situation."

"Go on," said Donal.

"Well, there are after all only two ways of imposing peace on a community—from the inside or from the outside. We don't seem to be able to do it to ourselves from the inside; so why not try imposing it from the outside?"

"And how would you go about that?"

"Quite simply," said William, leaning back in his float. "Let *all* the worlds have open markets, but appoint a separate, individual supra-planetary authority to police the markets. Equip it with sufficient force to back up its authority against even individual governments if need be—and appoint a responsible individual in charge whom governments will

think twice about tangling with." He raised his eyes calmly to Donal across the table and paused to let expectation build to its proper peak in this young man. "How would you like the job?" he asked.

"I?"

Donal stared at him. William's eyes were shrewd upon him. Donal hesitated; and the muscles of his throat worked, once.

"I?" he said. "Why, the man who commanded a force like that would be—" the word faltered and died, unspoken.

"He would, indeed," said William, softly. Across from him Donal seemed to come slowly back to himself. He turned narrowed eyes on William. "Why come to me with an offer like this?" he demanded. "There are older commanders. Men with bigger names."

"And that is just precisely why I come to you, Donal," replied William, without hesitation. "Their stars are fading. Yours is rising. Where will these older men be twenty years from now? On the other hand, you—" he waved a self-explanatory hand.

"I!" said Donal. He seemed to be dazzled. "Commander—"

"Call it Commander in Chief," said William. "The job will be there; and you're the man for the job. I'm prepared, in the name of Ceta, to set up a tax on interplanetary transactions which, because of our volume of trade, we will bear the most heavily. The tax would pay for your forces, and yourself. All we want in exchange is a place on a three-man commission which will act as final authority over you." He smiled. "We could hardly put such power in your hands and turn you loose under no authority."

"I suppose—" Donal was hesitant. "I'd have to give up my position around Procyon—"

"I'm afraid so," said William, frankly. "You'd have to remove any suspicion of conflicting interests."

"I don't know." Donal's voice was hesitant. "I might lose this new post at any time—"

"There's no need to worry about that," said William. "Ceta should effectively control the commission—since we will be paying the lion's share. Besides, a force like that, once established, isn't easy to disband. And if they're loyal to their commander—and your troops, I hear, usually are very much so—you would be in a position to defend your own position, if it came to that."

"Still—" Donal still demurred. "Taking a post like that I'd inevitably make enemies. If something *should* go wrong, I'd have no place to turn, no one would hire me—"

"Frankly," said William, sharply, "I'm disappointed in you, Donal. "Are you completely lacking in foresight?" His tone took on a little impatience. "Can't you see that we're inevitably trending toward a single government for all the worlds? It may not come tomorrow, or even in the next decade; but any supraplanetary organization must inevitably

grow into the ultimate, central authority."

"In which case," said Donal, "I'd still be nothing but a hired hand. What I want"—his eyes burned a little more brightly—"is to own something. A world . . . why not? I'm equipped to control a world; and defend it." He turned on William. "You'll have *your* position," he said.

William's eyes were hard and bright as two cut stones. He laughed shortly.

"You don't mince words," he said.

"I'm not that kind of man," said Donal, with a slight swagger in his tone. "You should have expected me to see through this scheme of yours. You want supreme authority. Very well. Give me one of the worlds—under you."

"And if I was to give you a world," said William. "Which one?"

"Any fair size world." Donal licked his lips. "Well, why not New Earth?"

William laughed. Donal stiffened.

"We're getting nowhere," said Donal. He stood up. "Thank you for the lunch." He turned and headed for the exit from the lounge.

"Wait!"

He turned to the sound of William's voice. The other man was also on his feet; and he came toward Donal.

"I've underestimated you again," said William. "Forgive me." He placed a detaining hand on Donal's arm. "The truth is, you've only anticipated me. Indeed, I'd intended you to be something more than a hired soldier. But . . . all this is in the future," he shrugged. "I can hardly do more than promise you what you want."

"Oh," said Donal. "Something more than a promise. You could give me a contract, confirming me as the supreme authority on New Earth."

William stared at him and this time he did laugh, loudly and long.

"Donal!" he said. "Excuse me . . . but what good would a contract like that be?" He spread his arms wide. "Some day New Earth may be mine to write you a contact for. But now—?"

"Still, you could write it. It would serve as a guarantee that you mean what you say."

William stopped laughing. His eyes narrowed.

"Put my name to a piece of writing like that?" he said. "What kind of a fool do you take me for?"

Donal wilted a little under the angry contempt in the older man's voice.

"Well . . . at least draw up such a contract," he said. "I suppose I couldn't expect you to sign it. But . . . at least I'd have something."

"You'd have something that could possibly cause me some slight embarrassment," said William. "I hope you realize it'd do nothing more than that—in the face of my denial of ever having discussed the matter with you."

"I'd feel more secure if the terms were laid out ahead of time," said Donal, almost humbly. William

shrugged, not without a touch of scorn.

"Come on then," he said; and led the way across the room to a desk. He pressed a stud on it and indicated a grille. "Dictate," he said.

Later, leaving William's suite of rooms with the unsigned contract in his pocket, Donal came out into the general hotel corridor outside so swiftly that he almost trod upon the heels of Anea, who seemed also to be leaving.

"Where away?" he said. She turned on him.

"None of your business!" she snapped; but an expression which the inescapable honesty of her face would not permit her to hide, aroused his sudden suspicions. He reached out swiftly and caught up her right hand, which was clenched into a fist. She struggled, but he lifted the fingers easily back. Tucked into the nest of her palm was a tiny contact snooper mike.

"You *will* continue to be a fool," he said, wearily, dropping her hand with the mike still in it. "How much did you hear?"

"Enough to confirm my opinion of *you!*" she hissed.

"Bring that opinion to the next session of the Conference, if you can get in," he said. And went off. She stared after him, shaken with a fury, and a sudden pain of betrayal for which she could find no ready or sensible explanation.

She had, she told herself through that afternoon and the evening that followed, no intention of watching the next session personally. Early the next morning, however, she found herself asking Galt if he would get her a visitor's pass to the Conference room.

The marshal was obliged to inform her that at William's request, this session of the Conference was to be a closed one. He promised, however, to bring her what news he could; and she was forced to rest uneasily content with that.

As for Galt, himself, he went on to the Conference, arriving some few minutes late and discovering that the session had already started. William himself had begun the proposal of a plan that made the Dorsai Marshal of Freiland stiffen to attention, even as he was sitting down on his float at the Conference table.

". . . To be established by a vote of this body," William was saying. "Naturally," he smiled, "our individual governments will have to ratify later, but we all know that to be pretty much a formality. A supra-planetary controlling body—having jurisdiction over trade and contracts, only—in conjunction with a general establishment of the open market, satisfies the requirements of all our members. Also, once this is out of the way, there should be no reason why we should not call upon the present insurgent government of New Earth to resign in favor of the previous, regular government. And I expect that if we call with a united voice, the present heads of state there will yield to our wishes." He smiled

around the table. "I'm open for questions and objections, gentlemen."

"You said," spoke up Project Blaine, in his soft, precise voice, "something about a supranational armed force which would enforce the rulings of this controlling body. Such an armed force is, of course, contrary to our principles of individual world-rights. I would like to say right now that I hardly think we would care to support such a force and allow it such freedom if a commander inimical to our interests was at its head. In short—"

"We have no intention of subscribing to a commander other than one with a thorough understanding of our own principles and rights," interrupted Arjean, of St. Marie, all but glaring at the Venusian. Galt's shaggy brows shot together in a scowl.

There was something entirely too pat about the way these two had horned in. He started to look over at Donal for confirmation of this suspicion but William's voice drew his attention back to the Cetan.

"I understand, of course," said William. "However, I think I have the answer to all of your objections." He smiled impersonally at all of them. "The top commanders, as you know, are few. Each one has various associations which might make him objectionable to some one or more of the delegates here. In the main, I would say what we need is a professional soldier who is nothing more than a professional soldier. The prime examples of this, of course, are our Dorsai—"

The glances around the table swung quickly in on Galt, who scowled back to hide his astonishment.

". . . The Marshal of Freiland would, therefore, because of his position in his profession and between the stars, be our natural choice. But—" William barely got the word out in time to stifle objections that had begun to voice themselves from several points around the table, "Ceta recognizes that because of the marshal's long association with Freiland, some of you may not welcome him in such a position. We're therefore proposing another man entirely—equally a Dorsai, but one who is young enough and recently enough on the scene to be considered free of political prejudice—I refer to the Protector of Procyon, Donal Graeme."

He gestured at Donal and sat down.

A babble of voices broke out all at once, but Donal was on his feet, looking tall, and slim, and remarkably young amongst the group of them. He stood, waiting, and the voices finally died down.

"I won't keep you for more than a minute," said Donal, looking around at them. "I agree thoroughly with Prince William's compromise solution to the problem of this Conference; because I most heartily believe the worlds *do* need a watchdog over them to prevent what's just now taken place, from happening." He paused, and looked around the table

again. "You see, honored as I am by Prince William's nomination, I can't accept because of something which just recently came into my hands. It names no names, but it promises things which will be a revelation to all of us. I also will name no names, but I would guess however that if this is a sample of what's going on, there are probably half a dozen other such writings being traded around."

He paused to let this sink in.

"So, I hereby refuse the nomination. And, further, I'm now withdrawing as a Delegate from this Conference in protest against being approached in this manner. I could not accept such a post or such a responsibility except with perfectly clean hands and no strings attached. Goodby, gentlemen."

He nodded to them and stepped back from their stunned silence. About to turn toward the exit, he stopped and pulled from his pocket the unsigned and nameless contract he had received from William the previous day. "Oh, by the way," he

said. "This is the matter I was talking about. Perhaps you'd all like to look it over."

He threw it onto the table in their midst and strode out. As he left the lounge behind him, a sudden eruption of voices reached to his ears.

He did not go directly back to his own suite, but turned instead to Galt's. The doorbot admitted him; and he made his way to the main lounge of the suite, striding in with the confidence of one who expects to find it empty.

It was not, however. He had made half a dozen long strides into the room before he discovered another person seated alone at a chess board on a little table, and looking up at his entrance with startled eyes.

It was Anea.

He checked and inclined his head to her.

"Excuse me," he said. "I was going to wait for Hendrik. I'll take one of the other lounges."

"No," she had risen to her feet. Her face was a little pale, but controlled. "I'm waiting for him, too. Is the session over?"

"Not yet," he replied.

"Then let's wait together." She sat down at the table again. She waved a hand at the pieces, presently set up in the form of a knights-castles problem. "You play?"

"Yes," he said.

"Then join me." It was almost an order the way she said it. Donal showed no reaction, however, but crossed the lounge and took a seat opposite her. She began to set out the pieces.

If she expected to win, she was mistaken. Donal won three swift games; but oddly without showing any particular flair or brilliance. Consistently he seemed able to take advantage of opportunities she had overlooked, but which had been there before her in perfect obviousness all the time. The games seemed more a tribute to her obtuseness, than his perception. She said as much. He shrugged.

"You were playing me," he said. "And you should rather have been playing my pieces."

She frowned; but before she had a chance to sort this answer out in her mind, there was the sound of steps outside the lounge, and Galt entered, striding long and excitedly.

Donal and she both rose.

"What happened?" she cried.

"Eh? What?" Galt's attention had been all for Donal. Now the older man swung on her. "Didn't he tell you what happened up to the time he left?"

"No!" She flashed a look at Donal, but his face was impassive.

Quickly, Galt told her. Her face paled and became shadowed by bewilderment. Again, she turned to Donal; but before she could frame the question in her mind, Donal was questioning Galt.

"And after I left?"

"You should have seen it!" the older man's voice held a fierce glee. "Each one was at the throat of everybody else in the room before you

were out of sight. I swear the last forty years of behind-the-scenes deals, and the crosses and the double-crosses came home to roost in the next five minutes. Nobody trusted anybody, everybody suspected everybody else! What a bombshell to throw in their laps!" Galt chuckled. "I feel forty years younger just for seeing it. Who was it that actually approached you, boy? It was William, wasn't it?"

"I'd rather not say," said Donal.

"Well, well—never mind that. For all practical purposes it could have been any of them. But guess what happened! Guess how it all ended up—"

"They voted me in as commander in chief after all?" said Donal.

"They—" Galt checked suddenly, his face dropping into an expression of amazement. "How'd you know?"

Donal smiled a little mirthlessly. But before he could answer, a sharp intake of breath made both men turn their heads. Anea was standing off a little distance from them, her face white and stiff.

"I might have suspected," she said in a low, hard voice to Donal. "I might have known."

"Known? Known what?" demanded Galt, staring from one to the other. But her eyes did not waver from Donal.

"So this was what you meant when you told me to bring my opinion to today's session," she went on in the same low, hate-filled voice. "Did you think that this . . . this sort of double-dealing would change it?"

For a second pain shadowed Donal's normally enigmatic eyes.

"I should have known better, I suppose," he said, quietly. "I assumed you might look beyond the necessities of this present action to—"

"Thank you," she broke in icily. "Ankle deep into the mud is far enough." She turned on Galt. "I'll see you another time, Hendrik." And she stalked out of the room.

The two men watched her go in silence. Then Galt slowly turned back to look at the younger man.

"What's between you two, boy?" he asked.

Donal shook his head.

"Half of heaven and all of hell, I do believe," he said; and that was the most illuminating answer the marshal was able to get out of him.

COMMANDER IN CHIEF

Under the common market system, controlled by the United Planetary Forces under Commander in Chief Donal Graeme, the civilized worlds rested in a highly unusual state of almost perfect peace for two years, nine months, and three days absolute time. Early on the morning of the fourth day, however, Donal woke to find his shoulder being shaken.

"What?" he said, coming automatically awake.

"Sir—" it was the voice of Lee. "Special Courier here to see you. He says his message won't wait."

"Right." Groggily, but decisively, Donal swung his legs over the edge of his sleeping float and reached for

his trunks on the ordinary float beside him. He gathered them in, brushing something to the floor as he did so.

"Light," he said to Lee. The light went on, revealing that what he had knocked down was his wrist appliance. He picked it up and stared at it with blurry eyes. "March ninth," he murmured. "That right, Lee?"

"That's right," responded the voice of Lee, from across the room. Donal chuckled, a little huskily.

"Not yet the ides of March," he murmured. "But close. Close."

"Sir?"

"Nothing. Where's the courier, Lee?"

"The garden lounge."

Donal pulled on the trunks and—on a second's impulse—followed them with trousers, tunic and jacket, complete outerwear. He followed Lee through the pre-dawn darkness of his suite on Tomblecity, Cassida, and into the garden lounge. The courier, a slim, small, middle-aged man in civilian clothes, was waiting for him.

"Commander—" the courier squinted at him. "I've got a message for you. I don't know what it means myself—"

"Never mind," interrupted Donal. "What is it?"

"I was to say to you 'the gray rat has come out of the black maze and pressed the white lever.' "

"I see," said Donal. "Thank you." The courier lingered.

"Any message or orders, commander?"

"None, thank you. Good morning," said Donal.

"Good morning, sir," said the courier; and went out, escorted by Lee. When Lee returned, he found Donal already joined by his uncle Ian Graeme, fully dressed and armed. Donal was securing a weapons belt around his own waist. In the new glare of the artificial light after the room's darkness, and beside his dark and giant uncle, the paring-down effect of the last months showed plainly on Donal. He was not so much thinned down as stretched drum-tight over the hard skeleton of his own body. He seemed all harsh angles and tense muscle. And his eyes were hollowed and dark with fatigue.

Looking at him, it would be hard not to assume that here was a man either on the verge of psychological and nervous breakdown, or someone of fanatic purpose who had already pushed himself beyond the bounds of ordinary human endurance. There was something of the fanatic's translucency about him—in which the light of the consuming will shows through the frailer vessel of the body. Except that Donal was not really translucent, but glowed, body and all, like one fine solid bar of tempered steel with the white, ashy heat of his consuming but all-unconsumable will.

"Arm yourself, Lee," he said, pointing to a weapons belt. "We've got two hours before sun-up and things begin to pop. After that, I'll be a proscribed criminal on any world but the Dorsai—and you two

with me." It did not occur to him to ask either of the other men whether they wished to throw themselves into the holocaust that was about to kindle about him; and it did not occur to the others to wonder that he did not. "Ian, did you make a signal to Lludrow?"

"I did," said Ian. "He's in deep space with all units, and he'll hold them there a week if need be, he says—incommunicado."

"Good. Come on."

As they left the building for the platform waiting them on the landing pad outside; and later, as the platform slipped them silently through the pre-dawn darkness to a landing field not far from the residence, Donal was silent, calculating what could be done in seven days time, absolute. On the eighth day, Lludrow would have to open his communication channels again, and the orders that would reach him when he did so would be far different from the sealed orders Donal had left him and which he would be opening right now. Seven days—

They landed at the field. The ship, a space-and-atmosphere courier N4J, was lying waiting for them, its ground lights gleaming dimly on steady-ready. The forward lock on the great shadowy cylinder swung open as they approached; and a scar-faced senior captain stepped out.

"Sir," he said, saluting Donal, and standing aside to let them enter. They went in and the lock closed behind them.

"Coby, captain," said Donal.

"Yes, sir." The captain stepped to a grille in the wall. "Control room. Coby," he said. He turned from the grille. "Can I show you to the lounge, commander?"

"For the time being," said Donal. "And get us some coffee."

They went on into the courier's lounge, which was fixed up like the main room on a private yacht. And presently coffee was forthcoming on a small autocart from the galley, which scooted in the door by itself and parked itself in the midst of their floats.

"Sit down with us, Cor," said Donal. "Lee, this is Captain Coruna El Man, Cor, my uncle Ian Graeme."

"Dorsai!" said Ian, shaking hands.

"Dorsai!" responded El Man. They smiled slightly at each other, two grimly-carved professional warriors.

"Right," said Donal. "Now that introductions are over—how long will it take us to make it to Coby?"

"We can make our first jump immediately we get outside atmosphere," answered El Man, in his rather harsh, grating voice. "We've been running a steady calculation on a standby basis. After the first jump, it'll take a minimum of four hours to calculate the next. We'll be within a light-year of Coby then, and each phase shift will take progressively less calculation as we zero in. Still—five more calculation periods at an average of two hours a period. Ten hours, plus the original four makes fourteen, straight drive and landing

in on Coby another three to four hours. Call it eighteen hours—minimum."

"All right," said Donal. "I'll want ten of your men for an assault party. And a good officer."

"Myself," said El Man.

"Captain, I . . . very well," said Donal. "You and ten men. Now." He produced an architectural plan from inside his jacket. "If you'll all look here; this is the job we have to do."

The plan was that of an underground residence on Coby, that planet which had grown into a community from a collection of mines and never been properly terraformed. Indeed, there was a question whether even with modern methods, it could be. Vega, an AO type star, was too inhospitable to its planets, even though Coby was the fourth out from her, among seven.

The plan itself showed a residence of the middle size, comprising possibly eighteen rooms, surrounded by gardens and courtyards. The differences, which only began to appear as Donal proceeded to point them out, from an above-ground residence of the ordinary type on other planets, lay in the fakery involved. As far as appearances went, someone in the house, or in one of the gardens, would imagine he was surface-dwelling on at least a terraformed world. But eight-tenths of that impression would be sheer illusion. Actually, the person in question would have ultimate rock in all directions—rock ten meters overhead at the furthest, rock underfoot, and rock surrounding.

For the assault party, this situation effected certain drawbacks, but also certain definite advantages. A drawback was, that after securing their objective—who was a man Donal did not trouble himself to identify—withdrawal would not be managed as easily as it might on the surface, where it was simply a matter of bundling everyone into the nearby ship and jumping off. A great advantage, however, which all but offset the drawback mentioned, was the fact that in this type of residence, the rock walls surrounding were honeycombed with equipment rooms and tunnels which maintained the above-ground illusion—a situation allowing easy ingress and surprise.

As soon as the four with him had been briefed, Donal turned the plans over to El Man, who went off to inform his assault party, and suggested to Lee and Ian that they join him in getting what sleep they could. He took himself to his own cabin, undressed and fell into the bunk there. For a few minutes his mind, tight-tuned by exhaustion, threatened to wander off into speculations about what would be taking place on the various worlds while he slept. Unfortunately, no one had yet solved the problems involved in receiving a news broadcast in deep space. Which was why, of course, all interstellar messages were taped and sent by ship. It was the swiftest and, when you came right down to it, the only practical way to get them there.

However, twenty years of rigid training slowly gained control of Donal's nerves. He slept.

He woke some twelve hours later, feeling more rested than he had in over a year. After eating, he went down to the ship's gym; which, cramped and tiny as it was, was still a luxurious accessory on a deep-space vessel. He found Ian methodically working out in the Dorsai fashion—a procedure the large dark man went through every morning when conditions did not prohibit it, as conscientiously and as nearly without thought as most men shave and brush their teeth. For several minutes Donal watched Ian on the single bar, doing arm twists and stands; and when his uncle dropped to the mat, his wide torso gleaming with perspiration and the reek of it strong in Donal's nostrils, Donal took him on at grips-and-holds.

The results were a little shocking to Ian. That Ian was stronger than he was only to be expected. His uncle was the bigger man. But Donal should have had a clear edge in speed, both because of age and because of his own natural reflexes, which were unusually good. The past year's strain and physical idleness, however, had taken their toll. He broke three holds of his uncle's with barely a fraction of a second to spare; and when he did, at last, throw the older man, it was by the use of a feint he would have scorned to use his senior year at school back on the Dorsai, a feint that took sneaking advantage of a slight stiffness he knew to be the result of an old wound in his uncle's deep-scarred left arm.

Ian could hardly have failed to recognize the situation and the reason behind the slightly unfair maneuver that had downed him. But nothing seemed to matter to him these days. He said nothing, but showered and dressed with Donal; and they went in to the lounge.

Shortly after they sat down there, there was the medication warning, and—a few minutes later—the shock of a phase shift. On the heels of it, El Man came walking into the lounge.

"We're in range, commander," he said. "If you want the news—"

"Please," said Donal.

El Man touched one of the walls and it thinned into transparency through which they could see the three-dimensional image of a Coby-man seated at a desk.

". . . Has been spreading," came the voice of the man at the desk, "following quickly upon the charges brought by the Commission for the Common Market System against Commander in Chief Graeme of the United Planetary Forces. The Com Chief himself has disappeared and most of his deep-space units appear presently to be out of communication and their whereabouts are presently unknown. This development has apparently sparked outbreaks of violence on most of the civilized worlds, in some cases amounting to open revolt against the established govern-

ments. The warring factions seem split by a fear of the open markets on the part of the general populaces, and a belief that the charges against Graeme are an attempt to remove what safeguards on the rights of the individual still remain in effect.

"As far as this office has been informed, fighting is going on on the present worlds—Venus, Mars, Cassida, New Earth, Freiland, Association, Harmony, and St. Marie; and the governments of the following worlds are known to be deposed, or in hiding—Cassida, New Earth, and Freiland. No outbreaks are reported on Old Earth, Dunnin's World, Mara, Kultis, or Ceta. And there is no present violence here on Coby at all. Prince William of Ceta has offered the use of his leased troops as a police force to end the disturbances; and levies of Cetan troops are either on, or en route to, all trouble spots at the present time. William has announced that his troops will be used to put down trouble wherever they find it, without respect to what faction this leaves in power. 'Our job is not to take sides,' he is reported as stating, 'but to bring some kind of order out of the present chaos and put out the flames of self-destruction.'

"A late signal received from Old Earth reports that a number of the insurgent factions are agitating for the appointment of William as World's Regent, with universal authority and strong-man powers to deal with the present emergency. A somewhat similar movement puts forward the name of Graeme, the missing Com Chief for a similar position."

"That's all for now," concluded the man at the desk, "watch for our next signal in fifteen minutes."

"Good," said Donal, and gestured to El Man to shut off the receiver, which the scarred Dorsai captain did. "How long until earthfall?"

"A couple of hours," replied El Man. "We're a bit ahead of schedule. That was the last phase shift. We're on our way in on straight drive now. Do you have co-ordinates on our landing point?"

Donal nodded; and stood up.

"I'll come up to control," he said.

The process of bringing the N4J in to the spot on the surface of Coby, corresponding to the co-ordinates indicated by Donal, was a time-consuming but simple procedure—only mildly complicated by Donal's wish to make their visit undetected. Coby had nothing to defend in the sense a terraformed world might have; and they settled down without incident on its airless surface, directly over the freight lock to one of the subsurface transportation tunnels.

"All right," said Donal, five minutes later, to the armed contingent of men assembled in the lounge. "This is an entirely volunteer mission, and I'll give any of you one more chance to withdraw without prejudice if you want to." He waited. Nobody stirred. "Understand," said Donal, "I want nobody with me simply because he was shamed into volunteering, or be-

cause he didn't want to hesitate when his shipmates volunteered." Again he waited. There were no withdrawals. "Right, then. Here's what we'll be doing. You'll follow me down that freight lock and into a receiving room with a door into a tunnel. However, we won't be taking the door, but burning directly through one of the walls to the service section of an adjoining residence. You've all seen a drawing of our route. You're to follow me, or whoever remains in command; and anyone who can't keep up gets left behind. Everybody understand?" He looked around their faces.

"All right," he said. "Let's go."

He led out down the passageway of the ship, out through their lock and down into the freight lock into the receiving room. This turned out to be a large, gloomy chamber with fused rock walls. Donal measured off a section of one wall and set his torchmen to work. Three minutes later they were in the service section of a Coby residence.

The area in which they found themselves was a network of small tunnels wide enough for only one man at a time, and interspersed with little niches and crannies holding technical devices necessary to the maintenance and appearance of the residence. The walls were coated with a permanent illuminating layer; and, in this cold white light, they filed along one of the tunnels and emerged into a garden.

The cycle of the residence's system was apparently now set on night. Darkness held the garden and a fine imitation of the starry heavens glittered overhead. Ahead and to their right was the clump of main rooms, soft-lit with interior light.

"Two men to hold this exit," whispered Donal. "The rest of you follow me."

He led the way at a low crouching run through the garden and to the foot of some wide stairs. At their top, a solitary figure could be seen pacing back and forth on a terrace before an open wall.

"Captain—" said Donal. El Man slipped away into the bushes below the terrace. There was a little wait in the artificial night and then his dark shadow was seen to rise suddenly upon the terrace behind the pacing figure. They melted together, sagged, and only the shadow of El Man was left. He beckoned them up.

"Three men to hold this terrace," whispered Donal, as they all came together at the head of the stairs. El Man told off the necessary number of the assault party; and they continued on into the lighted interior of the house.

For several rooms it seemed almost as if they would achieve their objective without meeting anyone other than the man they had come to seek. Then, without anything in the way of warning at all, they were suddenly in the middle of a pitched battle.

As they emerged into the main hall, hand weapons opened up on them from three converging rooms at once. The shipmen, automatically

responding to training, dropped to the floor, took cover and returned the fire. They were pinned down.

They were, but not the three Dorsai. Donal, Ian, and El Man, reacting in that particular way that was a product of genes, reflexes and their own special training, and that made the Dorsai so particularly valuable as professional soldiers—these three had responded automatically and in unison a split-second before the fire opened up on them. It was almost as if some small element of precognition had entered the picture. At any rate, with a reaction too quick for thought, these three swung about and rushed one of the enemy doorways, reached it and closed with their opponents within before that opposition could bring their fire to bear. The three found themselves in a darkened room and fighting hand to hand.

Here again, the particular character of the Dorsai soldier paid off. There were eight men in ambush within this particular room and they were all veteran soldiers. But no two of them were a match at hand-to-hand fighting with any single Dorsai; and in addition the Dorsai had the advantage of being able, almost by instinct, to recognize each other in the dark and the melee, and to join forces for

a sudden common effort without the need for discussion. The total effect of these advantages made it almost a case of three men who could see fighting eight who were blind.

In Donal's case, he plunged into the dark room right on the heels of El Man and to El Man's left, with Ian right behind *him*. Their charge split the defenders within into two groups and also carried them farther back into obscurity—a movement which the Dorsai, by common silent consent improved on for the purpose of further separating the enemy. Donal found himself pushing back four men. Abandoning three of these to Ian behind him under the simple common-sense precept that you fight best when you fight only one man at a time, he dove in almost at the level of his opponent's knees, tackled him, and they went down and rolled over together, Donal taking advantage of the opportunity to break the other soldier's back in the process.

He continued his roll and came up, pivoting and instinctively side-stepping. A dark body flung past him—but that instinct spoken of before warned him that it was El Man, flinging himself clear across the room to aid the general confusion. Donal reversed his field and went back the way from which El Man had come. He came up against an opponent plunging forward with a knife held low, slipped the knife, chopped at the man's neck with the calloused edge of his hand—but missed a clean killing stroke and only broke the man's collar bone. Leaving that opponent however in the interests of keeping on the move, Donal spun off to the right, cornered another man against the wall and crushed this one's windpipe with a stiff-fingered jab. Rebounding from the wall, and spinning back into the center of the room, his ears told him that El Man was finishing off one opponent and Ian was engaged with the remaining two. Going to help him, Donal caught one of Ian's men from behind and paralyzed him with a kidney punch. Ian, surprisingly enough, was still engaged with the remaining enemy. Donal went forward and found out why. Ian had caught himself another Dorsai.

Donal closed with both men and they went down in a two-on-one pin, the opponent in a stretcher that held him helpless between Donal and his uncle.

"Shai Dorsai!" gasped Donal. "Surrender!"

"Who to?" grunted the other.

"Donal and Ian Graeme," said Ian. "Foralie."

"Honored," said the strange Dorsai. "Heard of you. Hord Van Tarsel, Snelbrich Canton. All right then, let me up. My right arm's broken, anyway."

Donal and Ian let go and assisted Van Tarsel to his feet. El Man had finished off what else remained, and now came up to them.

"Hord Van Tarsel—Coruna El Man," said Donal.

"Honored," said El Man.

"Honor's mine," replied Van Tar-

sel. "I'm your prisoner, gentlemen. Want my parole?"

"I'd appreciate it," said Donal. "We've got work to do here yet. What kind of contract are you under?"

"Straight duty. No loyalty clause. Why?"

"Any reason why I can't hire you on a prisoner's basis?" asked Donal.

"Not from this job." Van Tarsel sounded disgusted. "I've been sold twice on the open market because of a typo in my last contract. Besides," he added, "as I say, I've heard of you."

"You're hired, then. We're looking for the man you're guarding here. Can you tell us where we'll find him?"

"Follow me," said Van Tarsel; and led the way back through the darkness; and opened a door. They stepped through into a short corridor that led them up a ramp and to another door.

"Locked," said Van Tarsel. "The alarm's gone off." He looked at them. Further than this he could not in honor go, even on a hired prisoner's basis.

"Burn it down," said Donal.

He and Ian and El Man opened up on the door, which glowed stubbornly to a white heat, but finally melted. Ian threw a concussion bolt at it and knocked it open.

Within, a large man with a black hood over his head was crouched against the far wall of the room, a miner's heavy-duty ion gun in his hand pointing a little unsteadily at them and shifting from one to the other.

"Don't be a fool," said Ian. "We are all Dorsai."

The gun sagged in the hand of the hooded man. A choked, bitter exclamation came from behind the mask.

"Come on." Donal gestured him out. He dropped the gun and came, shoulders bowed. They headed back through the house.

The fire fight in the hall was still going on as they retraced their footsteps; but died out as they reached the center hall. Two of the five men they had left behind there were able to navigate on their own power and another one could make it back to the ship with assistance. The other two were dead. They returned swiftly to the terrace, through the garden, and back into the tunnel, picking up the rest of their complement as they went. Fifteen minutes later, they were all aboard and the N4J was falling into deep space.

In the lounge, Donal was standing before the hooded man, who sat slumped on a float.

"Gentlemen," said Donal, "take a look at William's social technician."

Ian and El Man, who were present, looked sharply over at Donal—not so much at the words as at the tone in which he had said them. He had spoken in a voice that was, for him, unexpectedly bitter.

"Here's the man who sowed the whirlwind the civilized worlds are reaping at this moment," went on

Donal. He stretched out his hand to the black hood. The man shrank from him, but Donal caught the hood and jerked it off. A slow exhalation of breath slipped out between Donal's lips.

"So you sold out," he said.

The man before them was ArDell Montor.

COMMANDER IN CHIEF II

ArDell looked back at him out of a white face, but with eyes that did not bend before Donal's bleak glance.

"I had to have work," he said. "I was killing myself. I don't apologize."

"Was that all the reason?" asked Donal, ironically.

At that, ArDell's face did turn aside.

"No—" he said. Donal said nothing. "It was her," ArDell whispered. "He promised me her."

"Her!" The note in Donal's voice made the other two Dorsai take an instinctive step toward him. But Donal held himself without moving, under control. "Anea?"

"She might have taken pity on me—" ArDell whispered to the floor of the lounge. "You don't understand . . . living close to her all those years . . . and I was so miserable, and she . . . I couldn't help loving her—"

"No," said Donal. Slowly, the sudden lightning of his tension leaked out of him. "You couldn't help it." He turned away. "You fool," he said, with his back to ArDell. "Didn't you know him well enough to know when he was lying to you? He had her in mind for himself."

"William? *No*!" ArDell was suddenly on his feet. "Not him—with her! It can't be . . . such a thing!"

"It won't," said Donal, wearily. "But not because it depends on people like you to stop him." He turned back to face ArDell. "Lock him up, will you captain." El Man's hard hand closed on ArDell's shoulder and turned him toward the entrance to the lounge. "Oh . . . and captain—"

"Sir?" said El Man, turning to face him.

"We rendezvous with all units under Fleet Commander Lludrow as soon as possible."

"Yes, sir." El Man half-pushed, half-carried ArDell Montor out of the room; and, as if symbolically, out of the main current of the history of mankind which he had attempted to influence with his science for William, Prince of Ceta.

The N4J set out to make contact with Lludrow. It was not a thing to be quickly or easily accomplished. Even when it is known where it should be, it is far from easy to track down and pinpoint as small a thing as a fleet of human ships in the inconceivable vastnesses of interstellar space. For the very good reasons that there is always the chance of human error, that a safety margin must always be maintained—better to fall short of your target than to come out too close to it—and that there is, for practical purposes, no such thing as standing still in the universe. The N4J made a phase shift from where

it calculated it was, to where it calculated the fleet to be, sent out a call signal and got no answer. It calculated again, signaled again—and so continued until it got first, a very faint signal in response, then a stronger one, and finally, one which permitted communication. Calculations were then matched between the flagship of the fleet and the N4J—and at last a meeting was effected.

By that time, better than three more days of the alloted week of incommunicado had passed. Donal went aboard the flagship with Ian, and took command.

"You've got the news?" was his first question of Ludrow when the two of them were together again.

"I have," said the Fleet commander. "I've had a ship secretly in shuttle constantly between here and Dunnin's World. We're right up to date."

Donal nodded. This was a different problem from the N4J's of finding Ludrow. A shuttle between a planet whose position and direction of movement was well known, and a fleet which knew it's own position and drift, could hop to within receiving distance of that same planet in one jump, and return as easily, provided the distance was not too great —as it sometimes was between the various planets themselves—for precise calculation.

"Want to see a digest—or shall I just brief you?" asked Ludrow.

"Brief me," said Donal.

Ludrow did. The hysteria that had followed on the charges of the Commission against Donal and Donal's disappearance had caused the existing governments, already shaky and torn by the open-market dissention, to crumble on all the worlds but those of the Exotics, The Dorsai, Old Earth, and the two small planets of Coby and Dunnin's World. Into the perfect power vacuum that remained, William, and the armed units of Ceta had moved swiftly and surely. Protem governments in the name of the general populace, but operating directly under William's orders, had taken over New Earth, Freiland, Newton, Cassida, Venus, Mars, Harmony and Association and held them now in the iron grip of martial law. As William had cornered less sentient materials in the past, he had just prior to this cornered the field troops of the civilized world. Under the guise of training, reassignment, lease, stand-by—and a dozen other paper maneuvers, William had had under Cetan contract actual armies on each of the worlds that had fallen into disorder. All that had been necessary for him, was the landing of small contingents, plus officers for the units already present, with the proper orders.

"Staff meeting," said Donal.

His staff congregated in the executive room of the flagship. Ludrow, Fleet Commander, Ian, Field Commander—and half a dozen senior officers under each.

"Gentlemen," said Donal, when

they were seated around the table. "I'm sure all of you know the situation. Any suggestions?"

There was a pause. Donal ran his eye around the table.

"Contact Freiland, New Earth—or some place where we have support," said Ian. "Land a small contingent and start a counteraction against the Cetan command." He looked at his nephew. "They know your name—the professionals on all sides. We might even pick up support out of the enemy forces."

"No good," said Lludrow, from the other side of the table. "It's too slow. Once we were committed to a certain planet, William could concentrate his forces there." He turned to Donal. "Ship for ship, we overmatch him—but his ships would have ground support from whatever world we were fighting on; and our ground forces would have their hands full trying to establish themselves."

"True enough," Donal said. "What's your suggestion, then?"

"Withdraw to one of the untouched worlds—the Exotics, Coby, Dunnin's world. Or even the Dorsai, if they'll take us. We'll be safe there, in a position of strength, and we can take our time then about looking for a chance to strike back."

Ian shook his head.

"Every day—every hour," he said, "William grows stronger on those worlds he's taken over. The longer we wait, the greater the odds against us. And finally, he'll have the strength to come after us—and take us."

"Well, what do you want us to do, then?" demanded Lludrow. "A fleet without a home base is no striking weapon. And how many of our men will want to stick their necks out with us? These are professional soldiers, man—not patriots fighting on their home ground!"

"You use your field troops now or never!" said Ian shaking his head. "We've got forty thousand battle-ready men aboard these ships. They're my responsibility and I know them. Set them down on some backwater planet and they'll fall apart in two months."

"I still say—"

"All right. All right!" Donal was rapping with his knuckles on the table to call them back to order. Lludrow and Ian sat back on their floats again; and they all turned to look at Donal.

"I wanted you all to have a chance to speak up," he said, "because I wanted you to feel that we had explored every possibility. The truth of the matter is that both you gentlemen are right in your objections—just as there is some merit in each of your plans. However, both your plans are gambles; long gambles—desperate gambles."

He paused to look around the table.

"I would like to remind you right now that when you fight a man hand-to-hand, the last place you hit him is where he expects to be hit. The essence of successful combat is to catch your enemy unawares in an unprotect-

ed spot—one where he is not expecting to be caught."

Donal stood up at the head of the table.

"William," he said, "has for the last few years put his emphasis on the training of ground troops—field troops. I have been doing the same thing, but for an entirely different purpose."

He placed his finger over a stud on the table before him and half-turned to the large wall behind him.

"No doubt all you gentlemen have heard the military truism that goes—you can't conquer a civilized planet. This happens to be one of the ancient saws I personally have found very irritating; since it ought to be obvious to any thinking person that in theory you can conquer anything—given the necessary wherewithal. The case for conquering a civilized world, becomes then a thing of perfect possibility. The only problem is to provide that which is necessary to the action."

They were all listening to him—some a little puzzled, others doubtfully, as if they expected all of what he was saying to turn suddenly into some joke to relieve the tension. Only Ian was phlegmatic and aborbing.

"Over the past few years, this force, which we officer, has developed the wherewithal—some of it carried over from previous forces, some of recent development. Your men know the techniques, although they have never been told in what way they were going to apply them. Ian, here, has produced through rigorous training the highly specialized small unit of the field forces—the Group, which under ordinary battle conditions numbers fifty men, but which we have streamlined to a number of thirty men. These Groups have been trained to take entirely independent action and survive by themselves for considerable periods of time. This same streamlining has gone up through the ranks—extending even to your fleet exercises, which have also been ordered, with a particular sort of action in mind."

He paused.

"What all this boils down to, gentlemen," he said, "is that we are all about to prove that old truism wrong—and take a civilized world, lock, stock, and barrel. We will do it with the men and ships we have at hand right here, and who have been picked and trained for this specific job—as the planet we are about to take has been picked and thoroughly intelligenced." He smiled at them. They were all sitting on the edges of their floats now.

"That world,"—he pressed the stud that had been under his finger all this time; the wall behind him vanished to reveal the three-dimensional representation of a large, green planet—"is the heart of our enemy's power and strength. His home base—Ceta!"

It was too much—even for senior officers. A babble of voice burst out around the table all at once. Donal paid no attention. He had opened a drawer at his end of the table and produced a thick sheaf of documents,

which he tossed on the table before him.

"We will take over Ceta, gentlemen," he said. "By, in a twenty-four hour period, replacing *all* her local troops, *all* her police, *all* her garrisons and militia and law enforcement bodies and arms, with our own men."

He pointed to the sheaf of documents.

"We will take them over piecemeal, independently, and simultaneously. So that when the populace wakes up the following morning they will find themselves guarded, policed and held, not by their own authorities, but by us. The details as to targets and assignments are in this stack, gentlemen. Shall we go to work?"

They went to work. Ceta, large, low-gravity planet that it was, had huge virgin areas. Its civilized part could be broken down into thirty-eight major cities, and intervening agricultural and residential areas. There were so many military installations, so many police stations, so many armories, so many garrisons of troops—the details fell apart like the parts of a well-engineered mechanism, and were fitted together again with corresponding units of the military force under Donal's command. It was a masterpiece of combat preplanning.

"Now," said Donal, when they were done. "Go out and brief your troops."

He watched them all leave the conference room—all, with the exception of Ian, whom he had detained; and Lee, for whom he had just rung. When the others were gone, he turned to the two still with him.

"Lee," he said, "in six hours every man in the fleet will know what we intend to do. I want you to go out and find a man—not one of the officers—who doesn't think it'll work. Ian"—he looked over at his uncle—"when Lee finds such a man and reports to you, I want you to see that the man is sent up to see me, right away. Is that clear?"

The other two nodded; and went out, to do each his own job in his own fashion. So it was that a disgruntled Groupman from a particular landing force had a surprising meeting and surprisingly cordial chat with his commander in chief, and that they went out together, half an hour later, arm-in-arm, to the control room of the flagship, where Donal requested, and got, a voice-and-picture hookup to all ships.

"All of you," Donal said, smiling at them out of their screens after he had been connected, "have by this time been informed about the impending action. It's the result of a number of years of top-level planning and the best intelligence service we have been lucky enough to have. However, one of you has come to me with the natural fear that we may be biting off more than we can chew. Therefore, since this is an entirely new type of operation and because I believe firmly in the rights of the individual professional soldier not to be mishandled, I'm taking the un-

precedented step of putting the coming assault on Ceta to a vote. You will vote as ships, and the results will be forwarded by your captain, as for or against, to the Flagship here. Gentlemen"—Donal reached out an arm and brought the man Lee had discovered into the screen area with him—"I want you to meet Groupman Theiss, who had the courage to stand up like a free man and ask questions."

Caught unawares, and dazzled by the sudden limelight into which he had been thrust, the Groupman licked his lips and grinned a little foolishly.

"I leave the decision to all of you," added Donal, and signaled for the viewing eyes to be cut off.

Three hours later, Groupman Theiss was back on his own ship, astounding his fellow soldiers with an account of what had happened to him; and the votes were in.

"Almost unanimous," reported Lludrow, "in favor of the attack. Only three ships—none of the first line, and none troop carriers—voting against."

"I want those three ships held out of the attack," said Donal. "And a note made of their names and captains. Remind me about that after this is over. All right." He got up from the float where he had been sitting in the Flagship Lounge. "Give the necessary orders, commander. We're going in."

They went in. Ceta had never taken the thought of enemy attack too seriously. Isolated in her position as the single inhabitable planet, as yet largely unexplored and unexploited, that circled her KO type sun of Tau Ceti; and secure in the midst of an interstellar maze of commitments that made every other planetary government to some extent dependent upon her good will, she had only a few ships in permanent defensive orbit about her.

These ships, their position and movement fully scouted by Donal's intelligence service, were boxed and destroyed by Donal's emerging fleet almost before they could give warning. And what warning they did give fell on flabbergasted and hardly-believing ears.

But by that time the assault troops were falling planetward, dropping down on city and military installation and police station behind the curtain of night as it swung around the big, but swiftly-turning world.

They came down in most cases almost on top of their targets, for the ships that had sowed them in the sky above had not been hampered in that action by enemy harassment. And the reaction of those on the ground was largely what might have been expected, when veteran troops, fully armed and armored, move in on local police, untried soldiers in training, and men relaxed in garrison. Here and there, there was sharp and bitter fighting where an assault unit found itself opposed to leased troops as trained in war as they. But in that case, reinforcements were speedily brought in to end the action.

Donal himself went down with the fourth wave; and when the sun rose the following morning large and yellow on the horizon, the planet was secured. Two hours later, an orderly brought him word that William himself had been located—in his own residence outside the city of Whitetown, some fifteen hundred kilometers distant.

"I'll go there," said Donal. He glanced around him. His officers were busy, and Ian was off somewhere with an arm of his field troops. He turned to Lee. "Come on, Lee," he said.

They took a four-man platform and made the trip, with the orderly as guide. Coming down in the garden of the residence, Donal left the orderly with the platform, motioned Lee to accompany him, and entered the house.

He walked through silent rooms, inhabited only by furniture. All the residents of the house seemed to have vanished. After some little time, he began to think that perhaps the report had been in error; and that William was gone, too. And then he passed through an archway into a little anteroom and found himself facing Anea.

She met his gaze with a pale but composed face.

"Where is he?" asked Donal.

She turned and indicated a door on the far side of the room.

"It's locked," she said. "He was in there when your men started to land; and he's never come out. Nobody else would stay here with him. I . . . I couldn't leave."

"Yes," said Donal, somberly. He examined the locked door from across the room. "It wouldn't have been easy—for him."

"You care about him?" Her voice brought his head up sharply. He looked at her, seeking some note of mockery in her expression. But there was none. She was honestly questioning.

"I care somewhat for every man," he said. He walked across the room to the door and laid his hand upon it. On a sudden impulse, he put his thumb into the finger-lock—and the door swung open.

A sudden coldness blossomed inside him.

"Stay with her," he threw over his shoulder to Lee. He pushed open the door, found himself faced by another, heavier door—but one which also opened to his touch—and went in.

At the end of a long room William sat behind a desk occupied by a mass of papers. He stood up as Donal entered.

"So you're finally here," he said, calmly. "Well, well."

Going closer, Donal examined the man's face and eyes. There was nothing there to evoke such a notion; but Donal had the sudden suspicion that William was not as he should be.

"It was a very good landing. Very good," said William tiredly. "It was a clever trick. I acknowledge the fact, you see. I underestimated you from the first day I met you. I freely admit it. I'm quite conquered—am I not?"

Donal approached to the other side of the desk. He looked into William's calm exhausted face.

"Ceta is in my control," said Donal. "Your expeditionary forces on the other worlds are cut off—and their contracts aren't worth the paper they're written on. Without you to give the orders, it's all over with."

"Yes . . . yes, I thought as much," said William, with the hint of a sigh. "You're my doom, you know—my weird. I should have recognized it earlier. A force like mine among men must be balanced. I thought it would be balanced with numbers; but it wasn't." He looked at Donal with such a strange, searching expression that Donal's eyes narrowed.

"You're not well," said Donal.

"No, I'm not well." William rubbed his eyes, wearily. "I've been working too hard lately—and to no purpose. Montor's calculations were foolproof; but the more perfect my plan, the more perfectly it always went awry. I hate you, you know," said William, emotionlessly, dropping his hand and looking up at Donal again. "No one in all the history of man has ever hated the way I hate you."

"Come along," said Donal, going around the desk toward him. "I'll take you to someone who can help you—"

"No. Wait—" William held up his hand and backed away from Donal. Donal stopped. "I've got something to show you first. I saw the end the minute I got reports your men were landing. I've been waiting nearly ten hours now." He shivered, suddenly. "A long wait. I had to have something to keep myself occupied." He turned about and walked briskly back to a set of double doors set in a far wall. "Have a look," he invited; and pressed a button.

The doors slid back.

Donal looked. Hanging in the little close area revealed there was something only barely recognizable by what was left of its face. It was, or had been, his brother Mor.

SECRETARY FOR DEFENSE

Flashes of clarity began to return.

For some time, now and again, they had been calling him from the dark corridors down which he walked. But he had been busy, too busy to respond until now. But now—slowly—he let himself listen to the voices, which were sometimes those of Anea, and Sayona, and Ian, and sometimes the voices of those he did not know.

He rose to them reluctantly, slow to abandon the halls of darkness where he traveled. Here was the great ocean he had always hesitated to enter; but now that he was in it, it held him warm, and would have possessed him except for their little voices calling him back to petty things. Yet, duty lay to them, and not to it—that duty that had been impressed on him from his earliest years. The things undone, the things ill-done—and what he had done to William.

"Donal?" said the voice of Sayona.

"I'm here," he said. He opened his eyes; and they took in a white hospital room and the bed in which he lay, with Sayona and Anea and Galt standing beside it—along with a short man with a mustache in the long pink jacket of one of the Exotic psychiatric physicians.

Donal swung his legs over the edge of the bed and stood up. His body was weak from long idleness, but he put the weakness aside the way a man puts aside any irritating, but small and unimportant thing.

"You should rest," said the physician.

Donal looked at him casually. The physician looked away; and Donal smiled, to ease the man.

"Thanks for curing me, doctor," he said.

"I didn't cure you," said the physician, a little bitterly, his head still averted.

Donal turned his glance on the other three; and a sadness touched him. In themselves, they had not changed, and the hospital room was like similar rooms had always been. But yet, in some way, all had dwindled—the people and the place. Now there was something small and drab about them, something tawdry and limited. And yet, it was not their fault.

"Donal" began Sayona, on a strangely eager, questioning note. Donal looked at the older man; and he, like the physician, looked automatically away. Donal shifted his glance to Galt, who also dropped his eyes. Only Anea, when he gazed at her, returned his glance with a child's pure stare.

"Not now, Sayona," said Donal. "We'll talk about it later. Where's William?"

"One floor down . . . Donal—" the words broke suddenly from Sayona's lips in a rush. "What did you do to him?"

"I told him to suffer," said Donal, simply. "I was wrong. Take me to him."

They went slowly—and, on Donal's part, a little unsteadily—out the door and down to a room on the floor below. A man there lay rigid on a bed like the one Donal had occupied—and it was hard to recognize that man as William. For all the asepsis of the hospital, a faint animal smell pervaded the room; and the face of the man was stretched into a shape of inhumanity by all known pain. The skin of the face was tautened over the flesh and bones like cloth of thinnest transparency over a mask of clay; and the eyes recognized no one.

"William—" said Donal, approaching the bed. The glazed eyes moved toward the sound of his voice. "Mor's trouble is over."

A little understanding flickered behind the Pavlovian focusing of the eyes. The rigid jaws parted and a hoarse sound came from the straining throat. Donal put his hand on the drum-tight brow.

"It'll be all right," he said. "It'll be all right, now."

Slowly, like invisible bonds melting away, the rigidity began to melt out of the man before them. Gradually he softened back into the shape of humanity again. His eyes, now comprehending, went to Donal as if Donal's tall form was one light in a cavern of lightlessness.

"There'll be work for you to do," said Donal. "Good work. All you ever wanted to do. I promise you."

William sighed deeply. Donal took his hand from the brow. The eyes dropped closed; and William slept.

"Not your fault," said Donal, absently, looking down at him. "Not your fault, but your nature. I should have known." He turned a little unsteadily, to the others who were staring at him with new eyes. "He'll be all right. Now, I want to get to my headquarters on Cassida. I can rest on the way. There's a great deal to do."

The trip from the Maran hospital where both Donal and William had been under observation, to Tomblecity on Cassida, passed like a dream for Donal. Waking or dreaming, he was still half in that ocean into which at Mor's death he had finally stepped, and the dark waters of which would never entirely leave him now. It was to become finally a matter of living with it—this sea of understanding along the margin of which he had wandered all the young years of his life, and which no other human mind would be able to comprehend, no matter how long his explanation. He understood now why he understood—this much had the shock of Mor's death brought him. He had been like any young animal, hesitant

on the edge of the unknown, before his own uncertain desires and the sharp nudge of circumstance combined to tumble him headlong into it.

He had had to learn first to admit, then to live with, and finally to embrace his difference.

It had been necessary that what was uniquely Donal be threatened—first by the psychic shocks of the phase shift during the attack on Newton; and second by the manner of Mor's dying, for which only he knew how truly he was responsible—in order that he be forced to fight for survival; and fighting, discover fang and use of claw. In that final battle he had seen himself at last, full-imaged in the unplumbed depths; and recognized himself at last for what he was—a recognition no one else would ever be able to make. Anea, alone, would know without needing to understand, what he was; it is Woman's ancient heritage to appreciate without the need to know. Sayona, William, and a few such would half-recognize, but never understand. The rest of the race would never know.

And he—he himself, knowing and understanding, was like a man who could read, lifting the first small book from a library the shelves of which stretched off and away to infinity. A child in a taller land.

Anea, Sayona, Galt and the others came with him back to Tomblecity. He did not have to ask them to come with him. Now, they followed instinctively.

DONAL

The man was different.

Already, a few people were beginning to say it. And in this fact lay the seeds of a possible difficulty. It was necessary, considered Donal, that a means be taken to lightning-rod such a recognition, and render it harmless.

He stood in that position which was becoming very common with him of late, alone on a balcony of his residence outside Tomblecity, hands clasped behind his back like a soldier at parade rest, gazing out toward the Milky Way and the unknown stars. He heard Anea come up behind him.

"Sayona's here," she said.

He did not turn. And after a moment she spoke again.

"Do you want me to talk to him by myself?" she asked.

"For a little while," answered Donal, still without moving. He heard her footsteps move away from him into the bigness of the lounge behind him. He lost himself in the stars again; and, after a moment, there was the sound of a man's voice and a murmur of conversation between it and Anea's. At this distance, their words were indistinguishable; but Donal did not have to hear the words to know what they were saying.

Eight months had gone by since he had opened his eyes onto the full universe that was exposed to his view alone. *Eight months,* thought Donal to himself. And in that short time, order had been returned to the civilized worlds. A parliament of peoples

had been formed with an interiorly elected council of thirty-two Senior Representatives, two for each world. Today, here on Cassida, that parliament had voted on it's choice for a permanent Secretary for Defense—

Donal's mind reached out and enclosed the problem of what Sayona would, this moment, be saying to Anea.

". . . And then he went around the room, a little before the voting," Sayona's voice was now murmuring in the lounge behind him. "He said a word here, and a word there—nothing important. But when he was done, he had them in the palm of his hand. It was just as it was last month when he mingled with the delegates to the full parliament."

"Yes," replied Anea, "I can see it how it was."

"Do you understand?" asked Sayona, looking at her keenly.

"No," she said, serenely. "But I've seen it. He blazes—*blazes*—like an atomic flare among a field full of little campfires. Their small lights fade when they get too close to him. And he hoods his light, when he's amongst them, to keep from blinding them."

"Then you're not sorry—?"

"Sorry!" Her happy laugh tore his question to foolish ribbons.

"I know," said Sayona, soberly, "what effect he has on men. And I can guess his effect on other women. Are you sure you've got no regrets?"

"How could I?" But she looked at him suddenly, questioningly. "What do you mean?"

"That's why I've come tonight," said Sayona. "I've got something to tell you . . . if I can ask you a question after I'm through?"

"What kind of question?" she queried sharply.

"Let me tell you first," he said. "Then you can answer or not, whichever you like. It's nothing that can touch you—now. Only I should have told you before. I'm afraid I've put it off, until . . . well, until there was no more putting off possible. What do you know about your own gene history, Anea?"

"Why," she looked at him, "I know all about it."

"Not this part," said Sayona. "You know you were bred for certain things—" he put one old, slim hand on the edge of her float in a gesture that begged for understanding.

"Yes. Mind and body," she answered, watching him.

"And more," said Sayona. "It's hard to explain in a moment. But you know what was behind Montor's science, don't you? It treated the human race as a whole, as a single social entity, self-repairing in the sense that as its individual components die off they are replaced by the birth of new components. Such an entity is manipulable under statistical pressures, in somewhat the same manner that a human being may be manipulated by physical and emotional pressures. Increase the temperature of a room in which a man stands, and he will take off his jacket. This was William's key to power."

"But—" she stared at him. "*I'm* an individual—"

"No, no. Wait," Sayona held up his hand. "That was *Montor's* science. Ours on the Exotics had somewhat the same basis, but a differing viewpoint. We regarded the race as manipulable through its individuals, as an entity in a constant state of growth and evolution by reason of the birth of improved individuals among the mass that constituted it. Gene-selection, we believed, was the key to this—both natural or accidental, and controlled."

"But it is!" said Anea.

"No," Sayona shook his head slowly. "We were wrong. Manipulation by that approach is not truly possible; only analysis and explanation. It is adequate for an historian, for the meditative philosopher. And such, Anea, have we of the Exotics been, wherefore it seemed not only valid, but complete, to us.

"But manipulation by that means is possible only in small measure—very small. The race is not controllable from within the race; such gene-selection as we did could use only those characteristics which we *already* knew and understood. And it repelled us from those genes which we detected, and could not understand, and, of course, we could not work with ones we did not know existed, or could exist.

"We were, without seeing the fact, crippled both at the beginning and the end; we had only the middle. We could not conceive of characteristics to breed toward—goals—which were not already presented to us, and already understood by us. That was the proper end, however—truly new characteristics. And the beginning was, necessarily, truly new genes, and gene-combinations.

"The problem was stated long ago; we deceived ourselves that the statement was not meaningful. Simply, it is this; could a congress of gorillas, gathered to plan the breeding of the supergorilla, plan a human being? Discard the line of development of mightier muscles, stronger and longer teeth, greater specialization to master their tropical environment?

"Manipulation of the race from within the race is a circular process. What we can do, the valuable thing we can do, is to stabilize, conserve, and spread the valuable genetic gifts that come to us from outside our own domain.

"William—and you must have known this better than any one else, Anea—belongs to that small and select group of men who have been the conquerors of history. There's a name, you know, for this rare and freakish individual—but a name means nothing by itself. It's only a tag hung on something we never completely understood. Such men are unopposable—they can do great good. But also, usually, an equally great deal of harm, because they are uncontrolled. I'm trying to make you understand something rather complex. We, on the Exotics, spotted William for what he was when he was still in his early twenties. At that time the decision was taken to

select the genes that would result in you."

"Me!" She stiffened suddenly, staring at him.

"You." Sayona bent his head to her briefly. "Didn't you ever wonder that you were so instinctively opposed to William in everything he did? Or why he was so perversely insistent on possessing your contract? Or why we, back on Kultis, allowed such an apparently unhappy relationship to continue?"

Anea shook her head slowly. "I . . . I must have. But I don't remember—"

"You were intended as William's complement, in a psychological sense." Sayona sighed. "Where his instincts were for control for the sake of controlling, yours were toward goals, purposes, and you did not care who controlled so long as the control was directed toward that purpose. Your eventual marriage—which we aimed for—would have, we hoped, blended the two natures. You would have acted as the governor William's personality needed. The result would have beneficial . . . we thought."

She shuddered.

"I'd never have married him."

"Yes," said Sayona with a sigh, "you would have. You were designed—if you'll forgive the harsh word—to react at full maturity to whatever man in the galaxy stood out above all others." A little of Sayona's gravity lifted for a moment, and a twinkle crept into his eyes. "That, my dear, was by no means difficult to provide for; it would have been near impossible to prevent it! Surely you see that the oldest and greatest of the female instincts is to find and conserve the strength of the strongest male she can discover. And the ultimate conservation is to bear his children."

"But—there was Donal!" she said, her face lighting up.

"Quite so," Sayona chuckled. "If the strongest male in the galaxy were wrongly directed, misusing his great strength—still, for the sake of the great value of that strength, you would have sought him out. Strength, abilities, are tools; these are important. How they are used is a separate matter.

"But with Donal on the scene . . . Well, he was the ruin of all our theories, all our plans. The product of one of those natural accidents, outside our domain, a chance combining of genes even superior to William's. The blending of a truly great line of thinkers, with an equally great line of doers.

"I failed to realize this, even when we tested him." Sayona shook his head as though to clear it. "Or . . . perhaps our tests were just not capable of measuring the really important characteristics in him. We . . . well, we don't know. It's that that worries me. If we've failed to discover a true mutation—someone with a great new talent that could benefit the race, then we have failed badly."

"Why, what would it have to do with you?" she asked.

"It would be in the area where we

are supposed to have knowledge. If a cyberneticist fails to recognize that his companion has a broken bone, he is not culpable; if a physician makes the same mistake, he merits severe punishment.

"It would be our duty to recognize the new talent, isolate it, and understand it, we on the Exotics. It may be that Donal has something he does not recognize himself." He looked at her. "And that is the question I must ask you. You are closer to him than anyone else; do *you* think Donal may have something—something markedly different about him? I don't mean simply his superior genius; that would be simply more of the same kind of thing other men have had; I mean some true ability over and above that of the normal human."

Anea became very still for a long moment, looking beyond rather than at Sayona. Then she looked at Sayona again, and said, "Do you want me to guess? Why don't you ask him?"

It was not that she did not know the answer; she did not know how, or what she knew, nor did she know how to convey it, nor whether it was wise to convey it. But the knowing within her was quietly and completely certain that Donal knew, and would know what should and should not be said.

Sayona shrugged wryly. "I am a fool; I do not believe what all my own knowledge assures me. It was perfectly certain that the Select of Kultis would make such an answer. I am afraid to ask him; knowing that makes the fear no less. But you are right, my dear. I . . . will ask him."

She lifted her hand.

"Donal!" she called.

Out on the balcony he heard her voice. He did not move his eyes from the stars.

"Yes," he answered.

There were footsteps behind him, and then the voice of Sayona. "Donal—"

"You'll have to forgive me," said Donal, without turning. "I didn't mean to make you wait. But I had something on my mind."

"Quite all right," said Sayona. "I hate to disturb you—I know how busy you've been lately. But there was a question I wanted to ask."

"Am I a superman?" asked Donal.

"Yes, that's essentially it," Sayona chuckled. "Has somebody else been asking you the same question?"

"No," Donal was smiling himself. "But I imagine there's some would like to."

"Well, you mustn't blame them," said Sayona, seriously. "In a certain sense, you actually are, you know."

"In a sense?"

"Oh," Sayona made a little dismissing gesture with his hand. "In your general abilities, compared to the ordinary man. But that wasn't my question—"

"I believe you have said that a name is without meaning in itself. What do you mean by 'Superman'? Can your question be answered, if that tag has no meaning, no definition?

"And who would want to be a Superman?" asked Donal in a tone halfway between irony and sadness, his eyes going to the depth beyond depth of star-space. "What man would want sixty billion children to raise? What man could cope with so many? How would he like to make the necessitous choices between them, when he loved them all equally? Think of the responsibility involved in refusing them candy when they shouldn't—but could—have it, and seeing that they went to the dentist against their wills! And if 'Superman' means a unique individual—think of having sixty billion children to raise, and no friend to relax with, complain to, to blow off steam to, so that the next day's chores would be more bearable.

"And if your 'Superman' were so super, who could force him to spend his energies wiping sixty billion noses, and cleaning up the messes sixty billion petulant bratlings made? Surely a Superman could find some more satisfying use for his great talents?"

"Yes, yes," said Sayona. "But of course, I wasn't thinking of anything so far-fetched. He looked at Donal's back with mild annoyance. We know enough about genetics now to realize that we could not have, suddenly, a completely new version of the human being. Any change would have to come in the shape of one new, experimental talent at a time."

"But what if it were an undiscoverable talent?"

"Undiscoverable?"

"Suppose," said Donal, "I have the ability to see a strange new color? How would I describe it to you—who cannot see it?"

"Oh, we'd locate it all right," replied Sayona. "We'd try all possible forms of radiation until we found one you could identify as the color you were seeing."

"But still you wouldn't be able to see it, yourselves."

"Well, no," said Sayona. "But that would be hardly important, if we knew what it was."

"Are you sure?" persisted Donal, not turning. "Suppose there was someone with a new way of thinking, someone who in childhood forced himself to do his thinking within the framework of logic—because that was the only way those around him thought. Gradually, however, as he grows older he discovers that there are relationships for him that do not exist for other minds. He knows, for example, that if I cut down that tree just below us out here in my garden, some years in time, and some light-years in distance away, another man's life will be changed. But in logical terms he cannot explain his knowledge. What good would it do you then, to know what his talent *was*?"

"No good at all, of course," said Sayona, good-humoredly, "but on the other hand it would do him no good at all, either, since he lives in, and is part of a logical society. In fact, it would do him so little good, he would undoubtedly never discover his talent at all; and the mutation,

being a failure, would die aborning."

"I disagree with you," said Donal. "Because I, myself, am an intuitional superman. I have a conscious intuitive process. I use intuition consciously, as you can use logic, to reach a conclusion. I can cross-check, one intuition against the other, to find out which is correct; and I can build an intuitive structure to an intuitive conclusion. This is one, single talent—but it multiplies the meaning and the power of all the old, while adding things of its own."

Sayona burst out laughing.

"And since, according to my own argument, this ability would do you so little good that you wouldn't even be able to discover it, it therefore stands that you wouldn't be able to answer my question about being a superman in the affirmative, when I ask it! Very good, Donal. It's been so long since I've had the Socratic method used in argument against me I didn't even recognize it when I came face to face with it."

"Or perhaps you instinctively would prefer not to recognize my talent," said Donal.

"No, no. That's enough," said Sayona, still laughing. "You win, Donal. Anyway, thank you for setting my mind at rest. If we had overlooked a real possibility, I would have held myself personally responsible. They would have taken *my* word for it and—I would have been negligent." He smiled. "Care to tell me what the real secret of your success has been, if it's not a wild talent?"

"I *am* intuitive," said Donal.

"Indeed you are," said Sayona. "Indeed you are. But to be merely intuitive—" he chuckled. "Well, thank you, Donal. You don't know how you've relieved my mind on this particular score. I won't keep you any longer." He hesitated, but Donal did not turn around. "Good night."

"Good night," said Donal. He heard the older man's footsteps turn and move away from him.

"Good night," came Sayona's voice from the lounge behind him.

"Good night," answered Anea.

Sayona's steps moved off into silence. Still Donal did not turn. He was aware of the presence of Anea in the room behind him, waiting.

"Merely intuitive," he echoed to himself, in a whisper. *"Merely—"*

He lifted his face once more to the unknown stars, the way a man lifts his face from the still heat of the valley to the coolness of the hills, in the early part of the long work day when the evening's freedom is yet far off. And the look on his face was one which no living person—not even Anea—had seen. Slowly, he lowered his eyes, and slowly turned; and, as he turned, the expression faded from him. As Anea had said, carefully he hooded the brilliance of his light that he might not blind them; and, turning full around at last, entered once more, and for a little while again, into the habitation of Man.

THE END

LEVERAGE

BY CHRISTOPHER ANVIL

Settling new planets is apt to prove more a matter for ingenuity than for sheer power; even an interstellar technology is bound to be stretched mighty thin. And ... it wasn't the British who drove the Swedes out of New Jersey; they tried. But the mosquitoes did it.

Illustrated by Martinez

DAVE MORGAN squinted out the doorway of the communications shack at the plowed field baking in the midday sun. Dave glanced past a row of log cabins to a big tracked machine that sat near the edge of the thick intertwining forest. Beside the machine, a knot of men waved their hands around their heads, slapped, scratched, and scrubbed their shirts against their chests. Around them, over them, and on either side, long thick stalks arched out from the forest and dipped in toward the bare soil of the clearing.

On the ground near the men lay a long jointed metal arm with a buzz saw blade on a shaft at its end. Dave noted that this arm sat in the same spot as yesterday, the day before, and the day before that.

A dull clang, and the screech of a rusty nut turning on its stud, carried across the clearing.

Behind Dave, inside the communications shack, Al Weber slapped and growled. "How are they coming on the dozer?"

"Slow as mud."

"They got the arm bolted on yet?"

"They haven't touched the arm."

Weber swore and slapped again.

A droning whine drifted past Dave's ear, and there was a faint breeze on the back of his neck. He gave the gnat time to get settled, then slapped.

Weber said angrily, "That forest will walk right in and take root again if they don't hurry with the dozer."

"Sure," said Dave, "but it's hard to work when you're getting eaten alive." He scowled as a gray blur drifted over the line of cabins and faded toward the dozer.

The men there suddenly slapped, scratched, and waved their hands with a more desperate vigor.

"Funny," said Weber ironically. "We generally get our work done." He slapped, there was a crash, and Weber let out a bellow of sizzling profanity. Before he was through, he damned the men who found the planet, the advisors that led him, Dave, and the others, to it, and their present leader who consistently failed to untangle the mess.

Dave heard this as a familiar background noise, like the spatter and splash of rain streaming through the roof, or the grating creak of beetles shot-holing the beams. He made vague sympathetic noises, and squinted to look up at the glare of the sky. He thought he saw a tiny dot overhead.

Weber was silent a moment, then said, "I don't know if this will work or not. But it's that or crank the generator, and that would mean one of us couldn't do anything during transmission but heave up and down on the plunger."

Dave glanced around. Stacked in a pile near Weber were a number of flat squares about a yard on an edge. Weber said, "We might as well put them back on the roof now. Then we'll know if it was just an accident, or not."

Dave squinted up at the sky. He

could see the dot clearly now. "We'd better wait a while."

"Why? Lunch time?"

"Yes, and not only for us, either."

Weber grunted. He came over and peered up, then squeezed his eyes shut, looked away, and tried again. "Right you are."

The dot was growing to a black ball.

Dave took out a whistle on a cord around his neck. He drew a deep breath.

In the field, two of the men were on top of the dozer. Several others were starting toward the long jointed arm.

Dave put the whistle to his lips and blew hard.

His ears hurt.

The two men on top of the dozer jumped over the side.

The men headed for the arm, spun around and streaked for the dozer.

They all dove under it.

A bristle of gun-barrels poked out from underneath.

Dave stepped back and slammed the door shut. Weber heaved a wooden bar across it. Dave grabbed a heavy pole, thrust one end into a notch in an overhead beam, and jammed the other end against the bottom of the door. Weber jammed a second pole against the top of the door. Weber snatched up a long, thin-barreled gun. Dave grabbed an ax leaning against the wall.

Outside, someone yelled.

There was a whistling shriek and a booming clap, as of huge leathery wings abruptly filled with air. The door jumped as if struck with a club. It jumped, and jumped again. The pole at the top clattered down.

Light rapping sounds pattered on the door. There was a high-pitched scream close by.

The door jolted. The hinge at the top wrenched loose. The bar bent back. One of its brackets snapped off. The bar fell down. The door jerked inward. The bottom hinge squealed.

Weber flattened against the wall beside the door.

Dave stepped toward the hinge side of the door.

A set of big claws slid around the top of the door and jerked it inward.

Dave swung his ax and chopped off the claws.

A light rapping sound tapped on the door. Something whizzed past the leaning top of the door and stuck in the wall inside the cabin.

Weber thrust his gun around the edge of the door and pulled the trigger. He pulled the trigger again and again.

Dave raised his ax.

There was a scream outside. A blast of dirt and pebbles flew in. A scrambling noise dwindled fast into the distance, followed by the spaced flap of big wings, then an intense silence.

Dave and Weber glanced at each other soberly.

Weber took a deep breath, unsnapped a lever that fit tightly against the barrel of his gun, and worked it up and down. The lever moved a rod

that thrust down into the stock of the gun. There was a sound like the sucking, pumping noise of an air compressor.

Dave glanced at the lever, started to turn away, then looked back sharply. For an instant, his gaze grew glazed and distant. He blinked, then turned away frowning. He got a pair of needle-nose pliers and dropped the chopped-off claws in an empty parts box.

Weber took down the pole still braced against the bottom of the door, and pulled the door open. The other side was studded with darts. Outside, the men were streaming back from the dozer, carrying their guns, and waving their free hands in front of their faces. Their faces were set, and their eyes slitted.

"Time to eat," said Weber.

"Yeah," said Dave.

They started for the cook shack.

Dave walked in the cook's end of the cabin, and tossed the claws in the fire.

The cook whistled. "He get you?"

"No, he just got hold of the door. How's Abe coming?"

"Out of his head part of the time. But his arm's going down."

Dave nodded, and walked around a split-log partition into a room with a long rough table. On the far end of the table, near an open door, were set a number of compartmented trays with food and steaming mugs on them. The air in this room danced with tiny black specks.

Dave shut his mouth, closed one eye and squinted out of the other. A gnat promptly got in it. Gnats landed all over him. They crawled down his neck and up his wrists. He began to itch all over. He picked up a tray, carried it in one hand and his gun in the other, dodged around someone coming in, and walked outside along the line of cabins. He kept close to the cabins in case he should have to jump inside in a hurry. He kept his mind firmly on the simple business of walking to the doorway just ahead, and tried to ignore the hordes of biting crawling gnats.

There was the shrill blast of a whistle.

Dave stepped in through the doorway, and put the tray on a bench.

There was a whistling noise that shot closer fast.

A man dove headlong through the doorway. A shadow spread fast over the ground behind him. Dave realized there would be no time to shut the door, and jerked up his gun. He blinked, but the gnats were in his eyes and half-blinded him. There was a booming clap. The doorway went black.

Dave fired at the blackness.

There was an excited squeak-squeak-squeak, a clatter, and a hoarse human cry.

The blackness was gone. There was a *whoosh!* and a blur of huge wings outside. Dave fired without effect. He saw a black form in the air just off the ground, then a smaller form higher up, then yet a smaller one still higher, then it vanished be-

yond the trees at the end of the clearing.

Dave put his gun down, and for several moments did nothing but kill gnats.

Outside, someone said in a flat voice, "It got him. Damn it, it *got* him."

Dave now saw that his tray was upside down on the dirt floor, the food spread out in a long smear and the drink nothing but a blot in the dirt. Dave salvaged a half-box of dry D-rations, ate them, and was still hungry.

He picked up the tray, went to the door, glanced overhead, and started for the cookshack. On the way, he passed little groups of men, their eyes looking sidewise toward the last cabin in the row.

Someone said, "It wasn't him that should have been killed."

Dave put the tray in the cookshack, got some more darts for his gun, and pumped the lever of the gun. As he worked, he thought bitterly of the gap between theory and practice. In theory, this gun was ideal. Its light, reusable enzyme-tipped darts, fired by simple air pressure, would, he had been told, set off an irreversible reaction in the blood stream of the animal struck by the darts. The hunter need merely recoat the tip of the dart to use it again. Only small light containers of enzyme need be shipped in.

But in practice, the slightest breeze blew the darts away from the birds. The shock effect was nil. The darts glanced off the leathery skin unless they hit at just the right angle, and then the enzyme never troubled the creature's blood. The net result, Dave told himself, angrily, was that what an antique .45 caliber revolver would have settled in one blast, was never really ever ended by any number of the tricky darts.

Dave finished pumping the gun, went back outside, and automatically glanced overhead.

Someone said, "No need to worry now. It's *full* now."

Dave looked around. Nearly everyone had a sullen waiting look. The only movement seemed to be an automatic brushing at gnats.

A man with an expression of ingrained resentment said, "The bird got him because he never had a chance. Just like we don't have a chance. Not a chance in the world."

The men looked intent.

The man went on. "But just a few light-years from here, they're flying home in their big helicars right now."

It occurred to Dave that nothing good was likely to come out of this. He listened alertly.

"Yeah," said the man. "They've got their big helicars, all of them. They'll all float down, right on the beam, smooth and easy, and land right outside their apartments. No danger for them. No trouble. The dome will slide down easy over the landing shelf. They'll go in. It's cool inside. They'll go in and mix a cool drink . . ."

Dave glanced around. Everyone was listening.

". . . Then they snap on the trideo and stretch out on the smooth soft sofa. The girl loosens her jacket. The man— But we left all that. We left it. We—"

Dave looked up at the clear hot sky, and raised his hand to shade his eyes. He squinted, saw nothing, but looked anyway. He glanced down, blinked hard, and looked up again.

The voice stopped.

Dave glanced around.

Everyone was squinting at the sky except the man who had been talking. He was looking hard at Dave.

"Go on," said Dave. "Don't stop there. What happens next?"

The man's eyes narrowed.

"Go on," said Dave impatiently. "The girl was loosening her jacket. The man was coming across the room at her. Then what?"

Someone snickered.

The bitter-faced man glanced around. He said, "*We'll* never see a woman again. We—"

"That's right," said Dave. "The ship will bring the women in ten months. But the forest will grow up around us and the gnats will carry us off for souvenirs while we wait for you to tell us what happened after the girl—"

"Yeah," said a new voice. "What happened to the girl?"

Plainly anxious to forget all about the girl, the man snapped, "They went out to the synchrotherm and put on a steak. That's something else we'll never see again. Steak. We'll never—"

"Were you talking to the hunting party?" said Dave. "I didn't know they were back yet."

Someone else said, in a tone of surprise, "They *might* bring back meat, at that."

The mention of this possible good fortune seemed too much for the bitter-faced man to bear. He burst out angrily, "We'll never see a helicar again, never fly, never see another woman, never eat a steak—"

The men now turned to glance at each other. One of them said roughly, "Go eat some darts if you're hungry. We got troubles enough without all that croaking."

There was a growl of agreement, and a string of sarcastic comments:

"Say, boy, if you want to fly, go stand out in the middle of the field and wait. Maybe the bird will take you for a ride."

"No, no. The guy is really suffering, fellows. Let's take up a collection."

"If he's suffering that much, maybe we ought to ease his pain."

"Not till I hear what happened to the girl."

"Yeah, how about the girl?"

There was burst of laughter. Several of the men grinned and spat on the ground.

The bitter-faced man looked directly at Dave and said, "You won't live. The bird will take you next."

Dave saw the leader of the colony, a strongly-built man named Daniels, watching from the doorway of the

last cabin in line. Daniels beckoned to Dave.

Dave stood still a moment, then brushed some gnats away from his face, glanced up at the sky, and went down to Daniels' cabin.

It took Dave a moment to see in the comparative gloom of the cabin.

Daniels, looking at him thoughtfully, said, "Thanks."

"What for?"

"In the spot we're in, a troublemaker is a luxury. I was about to go out there and ram his teeth down his throat. You turned it into a joke. That's a better way to end it."

"I doubt it's ended."

"Ended for today. If we get from one day to the next, that's something. Each little advantage may give us room to get a little more." He glared out the door. "At least, if it weren't for these gnats, it would work that way."

Dave suddenly thought of the idea that had occurred to him as he saw Weber work the lever of the dart gun.

Daniels gave a heavy sigh. "Well, we didn't have to come out here. We made the choice, so we take the risk." He glanced at Dave. "How's Weber coming?"

"He wants to try the plates again."

"O.K. Any time he wants to. But tell him to just try a few at first." Daniels hesitated. "Tell Weber I appreciate the job he's doing. Patching those plates isn't easy."

Dave nodded. "Will you want me this afternoon?"

"No. Stay with Weber. And keep an eye on the sky for me. With all those gnats out in the field, we're lucky if we can see to raise a hammer." Daniels smiled. "And thanks again."

"That's O.K.," said Dave. He started to leave, then hesitated.

Daniels said, "What is it?"

Dave shrugged, "I've got an idea."

"God knows," said Daniels fervently, "we could use an idea. What is it?"

"When I was about fourteen," said Dave, "I helped my grandfather move a heavy rock. We each had a big crowbar. He'd lift and hold, and I'd slide my crowbar in and lift a little further, and hold while he slid his crowbar further in and lifted it, and then the rock would roll over. When we got through, he said, 'Boy, if you have a long enough lever, and a place to rest it, and a place to press against, you can move most anything. A great man said that once. You remember it.' It came back to me this morning when I saw Weber pump the lever on his gun."

Daniels listened closely.

Dave said, "About the same time, I remembered seeing a swarm of gnats drift over the cabins, ignore the cook, ignore Weber and me, and join the swarm of gnats around you and the men out in the field."

"They're worse out in the field. You and Weber and the cook were inside."

"After you came back to eat, I was inside the cookshack and they did everything but fly off with me."

Daniels frowned. "That's true. What's your idea?"

"I think the gnats, as a regular routine, gang up in one big swarm. Maybe they regularly prey on some kind of large animal, harass it to death, then feed on the carcass."

Daniels waved his hand in front of his face. "There are always a few around, wherever you go."

"Scouts," said Dave. "The main horde stays with the victim till he drops. At least, it looks like it to me. And if so—"

"I didn't think of that," said Daniels. "Earth gnats are a little more flexible, and I've just been assuming these are the same." He thought a moment. "But if they *do* stick together like that, maybe we can pry them loose enough so we can fix that dozer."

"That's what I was thinking."

"Come on," said Daniels. "Let's try it."

Dave, Daniels, and the rest of the men—save only Weber, who was putting his plates on the communications shack roof—started out in a group across the field. The gnats swarmed all over them. Lips pressed shut, eyes squinted, waving their hands in front of their faces, the men headed for the dozer.

When they got there, Daniels and a man with arms like a blacksmith stayed by the dozer. The rest trudged on with the gnats whining around them, and the big drooping shoots from the forest dangling in their faces.

When they reached the end of the field, two burly men stepped into the intertwining tangle of the forest. The rest of the men made a quarter-turn and stumbled across the end of the field, slapping fiercely.

When they reached the opposite side of the field, two more men slid into the forest. The tormented remainder, Dave included, turned in the opposite direction and shambled back across the field.

From the direction of the dozer came the scrape of metal, then:

CLANG!

CLANG!

CLANG!

For the next few minutes, the air resounded with the sounds of hard heavy work.

The men halted and devoted themselves to mere existence in the middle of a horde of gnats.

Time passed.

There was a whine that drowned out the whine of the gnats, followed by the grinding buzz of a saw cutting through wood.

A voice spoke from a short distance away.

"Relief for Dave Morgan and Jack O'Neill."

Dave started across the field. Someone said, "Daniels wants to see you. He's over at the cabins."

Dave stopped to get rid of the gnats that crawled over him from head to foot. When he got through, he discovered that he was still waving one hand automatically. He stopped, and glanced all around carefully.

He was free of them. Only an occasional gnat whined past.

A great weight seemed to lift, leaving him light-headed.

He took a glance overhead, then looked around. The dozer was working its way steadily down the field. The air resounded with the whine-*buzz*-whine-*buzz* of the saw cutting off the big shoots, and the chop and clatter as men cut them into lengths and tossed them in heaps.

Dave started for the cabins.

Daniels was looking at the communications shack with an expression of deep thought on his face. When Dave came up to him, he grinned. "It worked. It seems like a miracle."

"It sure does," said Dave, who had phantom images of innumerable gnats flitting around his head.

"I wonder," said Daniels. "How far can we carry this? If there are ten men on one side of the field, and one by one they walk over to the other side, at what point will the gnats go over, too?"

"That's a good question. We could try it and see."

Daniels nodded. "It seems to me there's some kind of pattern emerging here. While we were out on the field, Weber got some of his solar plates up on the roof. One of those crows, starlings, or whatever passes for them on this planet flew past, looked, flew back, and took a flying

dive at the plates. Pretty soon the air was full of them. They practically tore the plates to pieces."

Dave scowled. "First there was one? Then a whole bunch of them?"

"First one went over, flew back, took a closer look, and dove on the plate. Next, three or four flew in from various directions. Pretty soon, they were coming in from all points of the compass."

Dave looked away, scowling.

Daniels said, "Funny, isn't it?"

"Yeah," said Dave. "The gnats fly together in clouds. The trees twine together and send shoots in together from all sides at once. The birds attack in a group. This is a regular planet of together-ness."

"Don't forget the big bird."

"There don't seem to be too many of them yet," said Dave. "But for all we know, there's a hundred others flapping in from thousands of miles away."

"God forbid," said Daniels, alarmed.

Dave scowled and thought for a while. Finally, he said, "There's an advantage to concentrating all available force on your prey or your enemy, but the creatures on this planet seem to do it by reflex action. That's not so good. It's predictable. Did Weber have any idea *why* they dove on the plates."

"He thought maybe they saw faint reflected images in the plates, and the images didn't act right, so the birds attacked."

"Makes sense," said Dave dryly. "Obviously, the birds in this place are conformists. The images don't react like other birds. Ergo, tear them to pieces. Hm-m-m."

"Well," said Daniels, "it doesn't help us much. The plates have to be exposed to light, or they won't store any energy. But if they *are* exposed to light, some bird will fly past and see his image. Bang! And before we can get out there, the plates will be in shreds. Of course, if we had something we could pull over them in a hurry—"

Dave grinned faintly.

Daniels scowled. "What are you thinking of?"

"Does the cook have any pans?"

"Pans? What do we want with pans?"

"Never mind. Let's go see."

They went toward the cookshack, glanced uneasily overhead, then went inside.

Dave came out grinning, and yelled across to Weber in the communications shack.

Weber looked out and stared at him as if he were crazy.

Daniels came out of the cookshack and bawled out orders.

Weber shrugged, went into the communications shack, came out with a three-foot square plate, put a rough ladder against the roof, and started up.

Daniels helped boost Dave up onto the roof of the cookshack, and Dave put a big bright pan flat on the roof, then shoved one prong of a meat fork through a hole in the pan's rim and into the wood of the roof.

Dave climbed down off the roof and waited.

Overhead, there was a squawk.

A small black streak dropped down near the dishpan, and flew around inspecting it from all angles. There was a loud indignant squawk. Suddenly the bird landed a peck on the shiny pan. Where the bird's bill hit, could be seen the darting visual image of the reflection of the bill. The bird immediately shot around to the other side of the pan and tried to take the reflection by surprise.

The reflection was not fooled, and got there just as fast as the bird did.

There was a mighty clatter as the bird attacked the image.

More birds flew over, stared, dropped down, squawked, and dove for the pan.

The sky grew thick with birds flying in from all directions. The space around the pan erupted with flying feathers. There was a deafening clatter and squawk. Birds with their beaks open and their eyes shut rolled down the roof and fell off onto the ground.

Dave glanced around at Weber on the roof of the communications shack. Weber was bent forward with his eyes wide, his arms dangling, and his jaw hanging open. The big square plate lay on the roof beside him, but the birds were rushing past without the slightest notice.

Daniels choked, and burst out laughing. He shouted at the birds, "Get that nonconformist! Tear him to shreds! You may be a little beat-up yourselves at the end, but—Rip into him! Peck him! Kick him! Bite him! Yank his feathers out!" He turned to Dave. "Which side are you betting on?"

But now Dave was staring at the growing heap of upended birds piling up under the roof, with fresh squadrons rushing to the slaughter overhead. Suddenly he was reminded of a runaway nuclear pile. He turned around, and sprinted to the communications shack, got the pole used to brace the door, ran back to the cookshack and knocked the pan off the roof.

The birds rolled off in a big knot which broke into several struggling heaps.

"Get that pan out of here," said Dave. He kicked the swarms of fighting birds apart.

Daniels tossed the pan into the cookshack and helped kick apart the heaps of birds.

Dave finished pulling apart a little knot of diehards with their beaks in each other's feathers.

"A little more of this," he said, "might upset the balance of nature. Who knows what these birds may eat and keep in check?"

Daniels nodded.

The birds now straggled around and flew up in little groups to roost on the ridges of the cabins. They ran their beaks through their ruffled feathers, and sat on one foot to scratch at the sides of their heads. Then several of them looked fixedly out toward the field. The whole flock, save for those still heaped on the ground, took off for the field in a

cloud. This cloud of birds headed for the end of the field where the men stood doggedly waving their hands around their heads. The birds swirled and dove above the men.

Daniels said, "They're eating the gnats! We've solved it!"

The cook came out of the cookshack with a cloth bag in one hand, and a sharp knife in the other. He tested the knife with his thumb as he headed for the heaps of birds.

Daniels grinned. "Yes, sir, we've got it. Look at that. Meat."

The cook put down his knife and shoveled birds into the bag with both hands.

Dave frowned, and picked up the pole he'd taken from the communications shack.

"I don't know," he said, scowling. "It seems to me that in all the uproar we've lost track of something."

"Nonsense. Listen, without the gnats bothering us— Oh, I know, life may not be *perfect*. But this means, we've licked the *big* problems, so—"

The loud blast of a whistle cut across the field.

Dave saw Weber streak for the communications shack. Dave glanced swiftly up, then sprinted after him. He helped shove the door shut, then thrust the pole in a notch in the overhead beam, and jammed the other end of it against the bottom of the door.

Weber picked up the wooden bar, and dropped it in place. One end caught in its bracket, and the other end swung past the broken bracket, so the bar fell on the floor.

"My God," said Weber. "I forgot."

"I thought you did," said Dave. He jammed another pole in place to brace the top of the door, then picked up his ax. He looked at the door. The hinge side leaned slightly in at the top. "If that thing hits the door, he'll get in. The guns will only sting him. Is there another ax in here?"

"I think so. I'll look."

While Weber looked, Dave could hear a whilstling shriek that grew rapidly louder. He stepped to the wall on the hinge side of the door, and raised his ax. There was a loud clap. The door jumped inward. The top pole fell down. The door jumped again. There was a scream from the hinge and it leaned in.

Dave flattened against the wall.

The door sagged as a big set of claws shoved it in.

There was a flapping noise and the bend of a thick leathery wing shoved in the door.

Dave raised his ax a little higher.

Weber cried out, "I can't find one!"

Dave glanced quickly at the overhead beams to see if he had room enough.

A huge recurved beak on a long neck shot in the doorway, straight for Weber.

Dave swung the ax. He hit the long neck, stepped out and swung at the place where neck joined leathery shoulder. The huge wings jerked forward. A big set of claws reached

up. Dave chopped savagely at the neck. He chopped again and again, through tendons, gristle and bone. He chopped till the sweat ran in his eyes and his arms couldn't lift the ax.

The whole huge mass of leather leaned over and sagged backwards. Dave turned around, breathing hard, leaned against the doorframe and wiped the sweat out of his eyes. He saw Weber with one arm and both legs wrapped around the long neck just back of the head. In Weber's free hand was a knife. The knife was sunk to the hilt in one of the creature's big eyes. As Dave watched, the huge beak opened, the neck twitched, then the beak half-closed and lay still.

Outside, Dave could hear the sound of running feet. Someone looked in, and sucked his breath in sharply.

A familiar voice cried out in the distance. "I told you. One-by-one it will take us. We don't have a chance. Not a chance."

"Ah, shut up," said someone else. "They killed it."

Dave straightened up, still breathing hard, and looked around.

The inside of the cabin looked like a backwoods slaughterhouse after a busy day.

Daniels looked in, an expression of awe on his face. He said apologetically, "Maybe my victory proclamation was a little premature. I completely forgot about these things."

Dave said, "It just occurred to me . . . while I was chopping through that thing . . . why couldn't we have a deadfall? They always try to get in the place where they see us go in. Put a heavy rock in a frame over the door. Jerk out the pins that hold it just as they break down the door. Meat for dinner."

"Hm-m-m," said Daniels.

A new voice said, "We could even bait them down on purpose. Why not? I'm getting sick of waiting for these things to grab us. Why not decoy them in?"

The cook said, "Let me through. Watch the knife, please."

A familiar bitter voice remarked, "All the same, by the time the women get here, there'll be nothing waiting for them but a pile of bones, that's all. Nothing but—"

There was a solid crunching sound.

In the quiet that followed, the men gathered around to watch the cook, a big knife in his hand, bend over to study the bird.

Ten months later, in early spring, a ship came down with a cargo of supplies and highly nervous women. The crew of the ship looked out, squinted, looked away, blinked their eyes, looked back hard, and stared.

Big piles of firewood were already stacked amongst solid, weather-bleached cabins. From the side, fresh wood grew conveniently in toward the clearing, where it was apparently cut off by a man on a dozer.

Around the edge of the clearing sat a number of giant cages with huge sullen-looking birds peering out

between thick wooden bars. A man dressed like a chef ignored the ship to thoughtfully probe the ribs of one of these birds with a long stick.

Flights of smaller birds wheeled and dove overhead.

The crewmen scowled down and the colonists looked up impatiently.

"Where," said one of the crewmen in a low voice to another, "are the graves?"

"I don't know. I only see one."

"Well, they just don't get through the first winter without losing around fifty per cent. It never fails."

"We'll ask them. But we'd better hurry and unload. We don't have much time on this schedule."

"Let's go, then. I'm curious."

The colonists, however, acted for some reason as if they were more interested in greeting their women than in chatting with the crewmen.

The crew blasted off in a bad frame of mind. The colonists, they growled, could at least have told them a little more than one word.

"What does it *mean?*" the crewmen demanded.

" 'Leverage' !"

THE END

THE ANALYTICAL LABORATORY

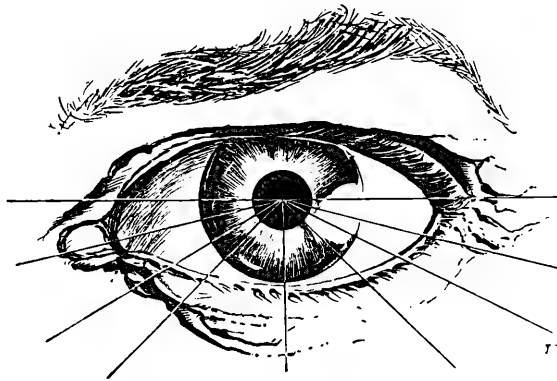
Trying to catch up on the Lab means two labs this issue—and shortage of space for review.

But . . . may I remind you readers that the authors wait with very real interest to hear your decisions? They just love to have you write a postcard or note expressing your opinions. This time, for instance, Murray Leinster will have your approving votes to thank for the extra $420.00 bonus you voted him for "Pirates of Ersatz," Parts I and II.

MARCH 1959

PLACE	STORY	AUTHOR	POINTS
1.	The Pirates of Ersatz (Pt.2)	Murray Leinster	2.08
2.	Despoilers of the Golden Empire	David Gordon	2.62
3.	Instinct	George O. Smith	3.18
4.	Translation Error	Robert Silverberg	3.42
5.	The Man Who Did Not Fit	Algis Budrys	4.38

(*Continued on page* 139)

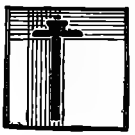


VANISHING POINT

BY C. C. BECK

In perspective, theoretically the vanishing point is at infinity, and therefore unattainable. But reality is different; vanishment occurs a lot sooner than theory suggests...

Illustrated by Martinez



HAT? Oh, that's a perspective machine. Well, not exactly, but that's what I call it. No, I don't know how it works. Too complicated for me. Carter could make it go, but after he made it he never used it. Too bad; he thought he'd make a lot of money with it there for awhile, while he was working it out. Almost had me convinced, but I told him, "Get it to working first, Carter, and then show me what you can do with it better than I can do without it. I'm doing pretty well as is . . . pictures selling good, even if I do make 'em all by guesswork, as you call it." That's what I told him.

Y'see, Carter was one a them artists that think they can work everything out by formulas and stuff. Me, I just paint things as I see 'em. Never worry about perspective and all that kinda mechanical aids. Never even went to Art School. But I do all right. Carter, now, was a different sorta artist. Well, he wasn't really an artist —more of a draftsman.

I first got him in to help me with a series of real estate paintings I'd got an order for. Big aerial views of land developments, and drawings of buildings, roads and causeways, that kinda stuff. Was a little too much for me to handle alone, 'cause I never studied that kinda things, ya know. I thought he'd do the mechanical drawings, which shoulda been simple for anybody trained that way, and I'd throw in the colors, figures and trees and so on. He did fine. Job came out good; client was real happy. We made a pretty good amount on the job, enough to keep us for a coupla months without working afterwards. I took it easy, fishing and so on, but Carter stayed here in the studio working on his own stuff. I let him keep an eye on things for me around the place, and just dropped in now and then to check up.

The guy was nuts on the subject of perspective. I thought he knew all there was to know about it already, but he claimed *nobody* knew anything about it, really. Said he'd been studying it for years, and the more he learned about it the more there was to learn. He used to cover big sheets of paper with complicated diagrams trying to prove something or other to himself. I'd come into the studio and find him with thumb tacks and strings and stuff all over the place. He'd get big long rulers and draw lines to various points all over the room, and end up with a little drawing of a cube about an inch square that anybody coulda made in a half a minute without all the apparatus. Seemed pretty silly to me.

Then he brought in some books on mathematics and physics and other things, and a bunch of slide rules, calculators, and junk. He musta been a pretty smart guy to know how to handle all those things, even if he was kinda dopey about other things. You know . . . women and fishing and sports and drinking; he was lousy at everything except working those perspective problems. Personally, I couldn't see much sense to what he

was doing. The guy could draw all right already, so I asked him what more did he want? Lemme see if I can remember what he said.

"I'm trying to get at things as they really are, not as they appear," he said. I think those were his words. "Art is an illusion, a bag of tricks. Reality is something else, not what we *think* it is. Drawings are two-dimensional projections of a world that is not merely three- but four-dimensional, if not more," he said.

Yeh, kind of a crackpot, Carter was. Just on that one subject, though; nice enough guy otherwise. Here, look at some of the drawings he made, working out his formulas. Nice designs, huh? Might make good wall paper or fabric patterns. Real abstract . . . that's what people seem to like. See all those little letters scattered around among the lines? Different kinds of vanishing points, they are. Carter claimed the whole world was full of vanishing points. You don't know what a vanishing point is? Lemme see if I can explain. Come over to the window here.

Ya see how that road out there gets smaller and smaller in the distance? Of course the road doesn't really get smaller—it just looks that way. That's what we call a vanishing point in drawing. Simple, isn't it? Never could understand why Carter went to so much trouble working out all those ways to locate vanishing points. Me, I just throw 'em in wherever I need 'em. But Carter claimed that was wrong. Said they were all connected together some way, and he was gonna work out a method to prove it.

Here . . . here's a little gadget he made up to help his calculations. Bunch of disks all pivoted together at the center; you're supposed to turn 'em around so the arrows point to the different figures and things. Here's the square root sign, I remember Carter telling me that. This one is the Tangent Function, whatever that means. Log, there, is short for logarithm. Oh, he had a bunch of that scientific stuff in his head all the time; dunno whether he understood it all himself. He built this thing just before he put together the perspective machine there.

Silly-looking gadget, huh? All them pipes and wires and that little cube in the center . . . don't try to touch it, it ain't really there. You just think it is. It's what Carter called a teteract, or a cataract . . . no, that ain't the right word. Somepin' like that—tesser something or other. There's a picture like it in one of Carter's books. Hurts your eyes to look at it, don't it?

That's what Carter thought was going to make him a lot of fame and money, that perspective machine. I told him nobody'd ever made a drawing machine yet that worked, but he said it wasn't supposed to make drawings. It was just supposed to give people a view of what reality really is, instead of what they think it is. I dunno whether he expected to charge money to look through it, or whether he was gonna look through it himself

and make some new kinda drawings and sell 'em.

No, I can't tell you how it works —I said before I don't know. Carter only used it once himself. I came in here the day he finished it, just as he was ready to turn it on. He was just putting the finishing touches on it.

"In a few minutes," he told me, "I'll have the answer to a question that may never have been answered before: what is reality? Is the world a thing by itself, and all we know illusion? Why do things grow smaller the farther away from us they appear? Why can't we see more than one side of anything at a time? What happens to the far side of an object; does it cease to exist just because we can't see it? Are objects not present nonexistent? Because artists draw things vanishing to points, does that mean that they really vanish?"

A wack, that's what he was. Nice guy, but sorta screwy. He kept saying more goofy things while he was finishing up the machine, about how he'd figured out that all we knew about vision and drawing and so on must be wrong, and that once he got a look at the real world he'd prove it.

"How about cameras?" I asked him. "Take a picture with a camera and it looks just about the same as a drawing, don't it?"

"That's because cameras are built to take pictures like we're used to seeing them," he said. "Flat, two-dimensional slices of reality, without depth or motion."

"Even 3-D moving pictures?" I asked.

"They're closer to reality," he admitted. "But they are still only cross sections of it. The shutter of a movie camera is closed as much of the time as it is open. What happens in between the times it's open?

"You know," he went on, "people used to think matter and motion were continuous, but scientists have proved that they are discontinuous. Now some of them think time may be too. Maybe everything is just imaginary, and appears to our senses in whatever way we want it to appear. We are so well-trained that we see everything just as we are taught to see it by generations of artists, writers, and other symbol-makers. If we could see things as they really are, what might happen?"

"We'd probably all go nuts!" I told him. He just smiled.

"Well, here goes," he said. "It's finished. Now to find out who is right, the scientists and philosophers who say reality is forever unreachable, or the artists who say there isn't any reality—that we make the whole thing up to suit ourselves."

He moved one of those pointers you see there, and squinted around at the different scales and dials, and then stepped back. That little tessy-thing appeared, real small at first. Just a point; you could hardly see it. I couldn't see anything else happening, and thought he was gonna do somepin' else to the machine. I turned to look at Carter, and saw his face was white as a sheet.

"Good Gawd!" he says, just like that: "Good Gawd!" That's all.

"Well," I says to him, "who was right, the scientists or the artists?"

"The artists!" he sorta screeches. "The artists were right all the time . . . there *is* no reality! It's all a fabric of illusion we've created ourselves! And now I've ripped a hole in that!"

He gives a strangled hoot and goes hightailin' outta here like somepin' was after him. Jumps in his car and roars off down the road and disappears.

Naw, I don't mean he really disappeared—are you nuts? Just roared on down the road till he got so small I couldn't see him no more. You know —the way things do when they go farther and farther away. Happens every day; that's what us artists mean by perspective.

The machine? Well, I dunno what to do with it. If Carter ever comes back he might not like my getting rid of it. I was thinking mebbe I'd put it in the hobby show at the county fair next week, though. Ya notice how that funny-looking cube inside there gets bigger every time you look at it? There . . . it just doubled its size again, see? People at the fair oughtta get a big kick outta that. No telling how big it'll get with all those people looking at it.

But come on, let's go fishing. We'd better hurry or it'll be too late.

THE END

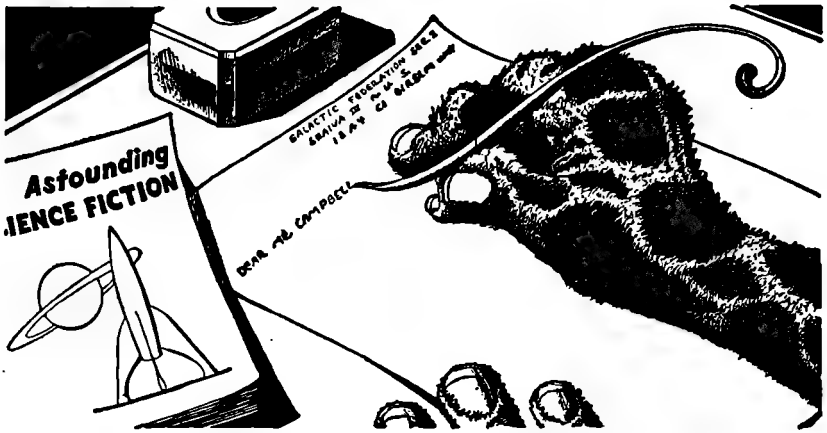
THE ANALYTICAL LABORATORY

(*Continued from page* 134)

APRIL 1959

PLACE	STORY	AUTHOR	POINTS
1.	The Pirates of Ersatz (Conc.)	Murray Leinster	1.95
2.	Now Inhale	Eric Frank Russell	2.12
3.	Wherever You Are	Winston P. Sanders	3.44
4.	Tie (Set a Thief	H. C. Elliott	4.28
	(The Catch	Gordon R. Dickson	4.28
5.	The Sieve	Christopher Anvil	4.60

THE EDITOR.



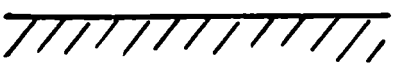
BRASS TACKS

Dear Mr. Campbell:

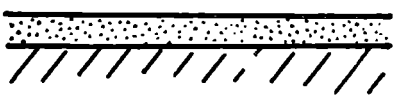
I have a theory . . .

The other day we had a slight fall of snow at home. This covered everything, including the backyard, with about one and a half inches of snow, in section thus:

Before the fall:



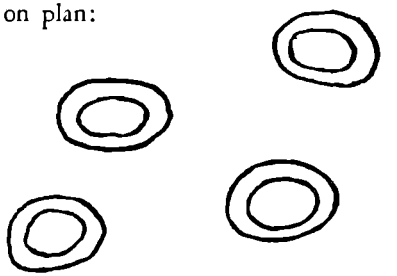
After the fall:



During the night, the cats went out and walked about in it—one of them is a bit young and had never seen snow before, so she pranced in it. Next morning, parts of the yard looked like this:

in section:

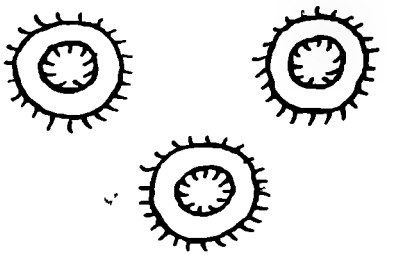
on plan:



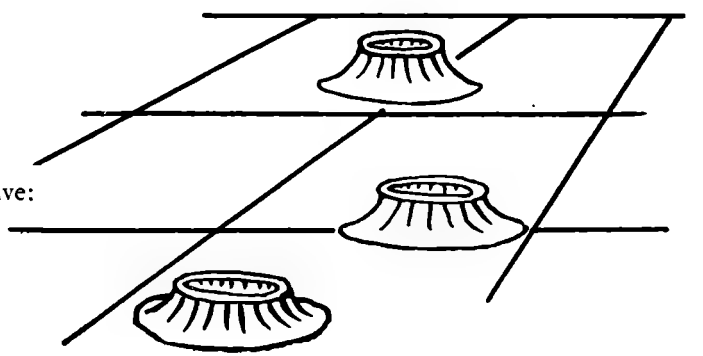
Next day, it thawed enough for the undisturbed snow to melt away and the stones dried up. What was left then looked like this:

in section:

on plan:



or in perspective:



Now, you see where all this is leading, don't you? You don't? You should!

Confidentially, I have discovered, at last, the true explanation of the moon craters — they were made by *ANIMALS* roaming about on the surface!! But what *sort* of animals?

Well now, Mr. Campbell, sir, I have a theory . . .—H. P. Powell, 25, Ship Street, Brighton, 1, Sussex, England.

Space-tigers, maybe?

Dear Mr. Campbell:

Hitler was a first-line genius????

By what criterion? The Stanford-Binet I-Q test? His paranoic philosophy of hate as recorded in "Mein Kampf"? His military leadership? His far-sighted planning? His statesmanship?

Certainly not by the fact that he was able to use the ancient technique of fear to bend a nation to his will. I contend that anyone in his position could have done the same.

I agree with you that Hitler was evil—as evil as any human can get. But a genius? Never!—Richard Green, 126 S. Gay Street, Knoxville, Tennessee.

He was a genius, whether we like that kind of genius or not.

Any individual who can tie world history in a knot is a genius by the test of extreme accomplishment.

Dear Mr. Campbell:

Concerning Psionic phenomena, specifically the "devining rod": It is completely evident that none of your readers has any inkling as to the theory behind the operation of the aforementioned.

As you know, the human nervous system consists of bundles of nerve fiber which may be likened to wires. The purpose of this system is to carry impulses of all stimuli from the point of reception—finger, toe, arm, et cetera—to the point of interpretation —the brain—and also to send motor control signals from the brain to the muscles.

I. When a loop of wire cuts a magnetic—electrical—field a current is generated in the wire.

II. When two different substances rub against each other a static electricity charge can and may build up.

III. In cases of metal pipes a magnetic field—very weak—surrounds the pipe.

IV. When the human body, or just a limb cuts through the field surrounding a pipe, a current is generated in the nerve fiber just as in wire.

V. The impulse travels from the point of reception to a point of interpretation.

VI. This impulse is of a different frequency than that of the frequency of the usual nerve impulses.

VII. This frequency is rejected from the conscious brain and is rerouted into a channel through which it can pass, it then stimulates this sector of the brain. This sector is not normally used and will not respond to

standard nerve impulses, that is nerve impulses not utilizing the frequency which it accepts.

Then through some action of this sector of the brain the two indicators will be moved so as to cut the field so that there will be no current generated in the rods.

So ends my theory on the operation of the "divining rods." I would like to let everyone know that I am very anxious to receive any info on any experimentation with this device or the Hieronymus machine.

Let's face it, fans, these devices actually work, there is no hocus pocus behind them. To find out what makes them work calls for a lot of experimentation, which calls for money which no one is willing to put out on such a project, therefore I call upon all interested fans to build a set of "divining" rods and get busy. We need to find out if the weather affects their operation, the exact amount of force exerted when the rods are pulled—this varies—establishment of a base metal or pipe, material size et cetera, upon which all experiments can be founded, strength of pull with different materials and not stuff like the following. "My wife said it had a lot of pull." Submitted respectively. —Donald C. Metcalfe, 649 Myrtle Avenue, South San Francisco, California.

Nice try—but no cigars!

If it were magnetic phenomena, scientific instruments of enormous sensitivity are available — the MAD for instance.

Whatever it is, it is not *either electrical or magnetic.*

Dear Mr. Campbell:

Some readers in the past have taken exception to the theme of Russell's "Wasp" and a few similar tales of scheming Earthmen upsetting future foes. After a bit of thought, it seems to me that while he is not entirely right, he has got something there.

Consider the ineffably dumbheaded Czech, Schweik, who did more harm to the Austrian cause as a soldier of same, than if he'd been a Russian. Consider the much sharper Gunner Asch and his wrangles with Wehrmacht red tape. Consider the real life case of Sergeant Major Coward, BEF, who took refuge in a barn full of German wounded during the Dunkirk fight, and woke to find a German general awarding him the Iron Cross. Of course, when they found it out, the balloon went up, and after that he provided the Nazis with as much trouble as one PW could manage. The Iron Cross incident set the tone and from there he improvised. Then also, there is the Captain of Köpenick, who upset a small German town with an old officer's uniform and his own natural amount of gall. There is a current movie about him as of this writing.

A man with a talent for being a heckler can do things to bureaucratic states that would make the average red taper go ape, if it is such slight things as having a wife in every port,

and allotments for same properly made out. This plays hell with budgets.

The Superman theme has its examples also, such as "Conan the Barbarian." A few years back one science-fiction reader brought up the real-life example of the seven-foot tall, hell raising Harald Hardrada, King of Norway, who went places and did things in a very Conanesque manner. He fought for the Byzantines and at home, and there is even a claim that he visited America (Vinland). In his later years he died in 1066, and got what the Saxon Harold promised him, "seven feet of earth, since he is said to be of uncommon stature."—John P. Conlon, 52 Columbia Street, Newark, Ohio.

Many a man gets away with things simply because most people think "No one could be that stupid" and aren't prepared for the moron who is.

Dear Mr. Campbell:

As for the March, '59 Astounding:

Plaudit! That premeditated, unique hoax, "Despoilers of the Golden Empire," was subtly executed. Encores, please. And I accept Mr. Gordon's apologia in Brass Tacks as valid. Your editorial, "The Superman," tied in nicely with it, too. In fact, the whole issue had a good continuity.

I can't comment on the serial, though, because I never read one until I have all the installments. I don't like to break the continuity. "The Pirates of Ersatz" seems promising, anyway.

Certainly, every significant phase of history is well seeded with Supermen. Who else could lead Homo Ordinary across the threshold into the New Era? The rank and file of mankind are generally resistant to change; true, they often like variety, or change in style, but not change in basic form. They cling desperately to the Old Ways, even though it means destruction or stagnation. Then Superman appears on the scene as a Great Innovator; a ruthless icon-smasher who envision a New Order.

Homo Ordinary is reform-minded; Homo Superior is revolution-minded.

Thus, in addition to the inferiority complex ordinary folk receive from observing him in action, Superman is also a pain source because he is always "up to something."

Not to detract from the performances of Pizarro and Cortez—it took Supermen to accomplish what they did—but the Aztec and Inca cultures were ready to die; waiting for the Hatchet Men. Especially was the Inca, which had sunk into cultural apathy, while the Aztec hovered at rage level. Ergo, Cortez had a more difficult task than did Pizarro.

For that matter, Spain was sinking below its zenith even as the New World conquests were being successfully completed. It had the fact painfully demonstrated when it called for a showdown with a culture whose dynamic was rising—Elizabethan England. That doughty Island had some superduper Supermen directing

operations, too. Also a Superwoman, Queen Beth!

"Instinct," by George O. Smith, postulates a convincing, but frightening, method for releasing the latent powers of the human mind. I wonder if average minds could endure the dreadful pressure and turbulence necessary to crack the Barrier by this means. Or, perhaps, it's another case of "only Supermen need apply."

All the capable misfits who read "The Man Who Did Not Fit," by Algis Budrys, must have identified empathetically with Michael Wireman as the story began to strike responsive chords. I wish the plot had been developed into a serial.

After reading it, I made a quick scan of history, searching for misfits and came up with a real King of the Oddballs—Ulysses S. Grant. His detractors to the contrary, he was one of the most capable generals and tacticians this country has ever produced. Primarily an innovator, he had the persistence of Pizarro.

Rejected and ridiculed from childhood, believed in by no one, he had come to regard himself as a hopeless case, when Destiny tapped him on the shoulder and said "O. K., Ulysses, this is it!" And, of course, his transition from jerk to hero seemed miraculous to everyone except I suppose, students of misfits.

And "Translation Error," by Robert Silverberg, is a poignant reminder of what Man might have become if he hadn't taken a mechanistic view of the Universe and begun to develop technologically at the expense of his psychic powers—and racial happiness. There seems something so compulsive in this frenetic surge called Civilization. Free Will, in our present world, sounds like the protesting chirp of a cricket in a maelstrom.

There couldn't *really* be any Extraterrestrial Manipulators involved, could there?

A poser occurred to me: Since Man is one hundred per cent subject to the Laws of the Universe, which Law is he obeying when breaking Laws of the Universe?—Hal J. Martin, P. O. Box 26, Del Mar Heights, Morro Bay, California.

Man never breaks the Laws. But like a clever shyster lawyer, he can use the Laws to accomplish his ends.

Dear Mr. Campbell:

Several things regarding your March issue: First of all there is one error of fact in the Gordon story, blowguns were not used in fighting in any area of America—and such snipers as existed could aim for the unprotected face of the Spaniards. Also one of the many factors in the Spanish victories was that they had a concept of tactics other than the mad mob scene that the Indians favored, also cavalry is very effective against any infantry not equipped with pikes—see any medieval military history. All this does not change the point though, as far as the Indians were concerned, Cortez was a superman; Cortez, not all Spaniards, since

several other expeditions had been beaten off with heavy loss.

As for your society of Gentlemen Amateurs, anybody have an amateur surveyor around? We could use some good maps of our archeological sites; also we can furnish material for anyone interested in soil chemistry or minerology. Been digging up Indian fishing and village sites, a revolutionary fort and a backwoods settlement if anything in those fields would be helpful to anybody outside the archeological disciplines. — Michael Cohn, 220 Cabrini Boulevard, New York 33, N. Y.

Pizzaro did find it expedient to wear armor day and night, blow guns or not. There was plenty of other danger.

And who—other than Hitler—ever suggested that all Spaniards—or any other breed—were supermen?

Dear Mr. Campbell:

Beyond doubt, you—and many of your readers—should be positively delighted to learn that the 17th World Science Fiction Convention (Detention) shall have as Guest of Honor:

Poul Anderson

and as Toastmaster:

Isaac Asimov

Just in case a few of your readers have missed or mislaid our various announcements, please remind them that Detention meets Labor Day weekend (September 4th through 7th) at the Pick-Fort Shelby Hotel in Detroit, Michigan. Anyone interested in joining Detention should send their $2 membership fee—overseas membership $1 — or just write for more information, to Detention, 12011 Kilbourne, Detroit 13, Michigan.

Detention, remember, is good for you.—The Detention Committee, Fred Prophet & Roger Sims, Co-Chairmen.

The question is, will anybody really notice a Guest of Honor when Ike is Toastmaster? He's more fun—

Dear Mr. Campbell:

The January issue really gets at some basics of society. Study in still life is, of course, based on the Parkinson's Law but did anyone notice that "Deadlock" also states one of the laws of bureaucracy, namely: If the rulers make a compromise, the place where it will be felt most is the taxpayer's pocket! Or in simpler terms: The compromise will always be more expensive than either of the suggestions it is compromising. By the way, Finland has seven political parties—an eighth coming up this year—which makes compromises highly necessary as none of them has absolute majority. Finland also has one of the highest income taxes in the world.—Juhani Rainesalo, Nervanderinkatu 1 B 24, Helsinki, Finland.

There is that about political compromise!

THE REFERENCE LIBRARY

BY P. SCHUYLER MILLER

CATASTROPHES

THE Sumerians did it first, as they did most things. Their story of Ziusudra, who built a giant ship in which ne and his outlasted the flood with which the gods were devastating the Earth, filtered on down through Akkadian . . . Canaanitic . . . Hebrew . . . to those latter-day People of the Sea, the English. Ziusudra's story, impressed on some fragments of clay from the ancient city of Nippur, may have been

the historical record of a hill folk who had come down into the soggy plain of the lower Tigris-Euphrates, and who were appalled at what happened there when the spring rains came and the snows melted on their faraway hills. Certainly it wasn't fiction as we know it, though it was woven into the great epic of the "Black-Headed People," the story of Gilgamesh.

Presumably there is some such reason why the English have developed a talent for destroying our world, with the help of their sea. I know that many an American G. I., looking on England through what would have been a nasty drizzle back in Indiana, swore that if the cables of the barrage balloons were cut, the whole island would sink into the sea . . . but this is nothing but hyperbole. I know that English tradition goes a long way back, but it seems improbable that even the oldest families have passed down from twenty-odd thousand years ago the story of what Uncle Albert did when the lands sank and the gray sea broke through, forever cutting England off from continental matters until Albert's descendants built a bridge with ships.

Whatever the cause, older readers may remember S. Fowler Wright's "Deluge" and "Dawn," two of the first "modern" science-fiction novels I discovered after exhausting the local library's skimped supply of Wells. In our own time, John Wyndham has pointed out our vulnerability to what dwells in the sea, in his striking "Out of the Depths"—though his book is not really one of a world cataclysm. Now, within two months' time, Ballantine has brought out paperback editions of a pair of novels by English authors, who destroy the world in diametrically opposite ways—which may, oddly enough, be effects of the same cause. I imagine both books have had "full" hardback publication back in England.

First, and best, of the pair is John Bowen's "After the Rain"—Ballantine No. 284-K; 158 pp.; 35¢—in which a new deluge, never explained, drowns the world. Second, and the best he has done, is Charles Eric Maine's "The Tide Went Out"—No. 290-K; 156 pp.; 35¢—in which the seas run out like an emptying bathtub, through a hole we've blown in the bottom.

Quite apart from mystical movings in the racial protoplasm, the urge to write another "catastrophe" story must be very like the urge that drove the late Cecil B. DeMille to produce his super-colossal spectacles. You can assemble a cast of millions and use a setting as big as the world. You are practically unlimited as to special effects. You can gear the plot for pure spectacle, or you can use it as a parable of the nobility or ignobility of Man.

Although neither of our present authors says very much in rationalization of his catastrophe—Bowen, I'd say, is deliberately misleading with his opening comedy of a Texan rainmaker—an article by the Canadian geophysicist, J. Tuzo Wilson, in the March 1959 issue of *American Scien-*

tist, suggests a mechanism that could be stretched to take care of them both. He points out that our present seas probably came out of the Earth, where the water had been dissolved in molten rock: if so, some new disturbance *could* bring forth more water. By the same token, he suggests that volcanic activity may leave hollows in the lower depths—and that's exactly where the sea went in Maine's story.

Both authors focus on a small cast of characters, since only a Stapledon could handle all Mankind as his hero, and do it convincingly. From there on, their ways divide.

The hero of "After the Rain," John Clarke, is an English journalist who was in Texas with his comic rainmaker, Mr. Uppingham, when the rain that drowned the world began. Days later he sets out in a small boat to get a friend's wife to safety in the country — and one of those long, across-the-world treks of bland horror and patient understatement, such as we had in John Christopher's very different catastrophe, "No Blade of Grass," gets under way. It eventually brings Clarke, with a rescued ballet dancer, to the tolerable safety of a well-stocked raft inhabited by one of fiction's strangest assortments of humanity.

Now the author has his microcosm, and he stays with it until the Flood is over and the survivors have started a new life on some kind of new Earth. He draws his characters broadly but well, playing off Clarke's indecisive attempts to break the already established "pecking order" of the raft, against the cold efficiency of Arthur Renshaw, the ex-accountant who has made himself master of the unwieldly ark—and who eventually proclaims himself God. It's an uninspiring picture of humanity at its least human, but the tatterdemalion crew—some of them—do muddle through in the end, both in spite of and because of themselves.

"The Tide Went Out" is closer to formula, less realistic, and played more for the big mob scenes. Its hero is Philip Wade, editor of an English picture-magazine, who has done a feature article that hits too close to fact. H-bomb tests in the Pacific have blown a hole in the bottom of the sea, which is running out; as shifting stresses and pent-up steam bring about earthquake and tidal wave, other rifts open and at last the seas are dry.

The Earth's governments, meanwhile, are establishing refugee camps in the arctic and antarctic regions, where they hope the polar caps will provide enough water for a few people for long enough to find a permanent solution. Through personal politics, Wade gets into the propaganda machine, and his story is an account of the "ins" struggling to hold up a screen of misinformation and confusion in front of the public, while they finish the refuge for themselves. Predictably, Wade at last finds himself outside the fence, fighting to get in.

These two books, out of similar situations, draw diametrically oppo-

site conclusions. John Bowen is saying that, although human institutions —society itself—may be destroyed, men and women are tough enough to survive and rebuild something for themselves. Maine is saying that only institutions are immortal, and in a crisis will perpetuate themselves by destroying the individuals of whom and for whom they are supposed to exist. Both are realistic appraisals of our world as we see it around us. In blitzed London, in Germany and Japan under the retaliatory saturation bombing, both institutions and individuals survived against incredible odds. Even under the devastation of nuclear warfare, I believe that men—some kind of men—will survive and start again to build societies, though bacterial warfare can make us as extinct as the mammoths our ancestors hunted. All around us, even in the West, we see government reducing the individual to a stray, unpredictable datum—yet through history, governments have been forgotten where people lived on.

So John Bowen not only has made a better case, through his skill as a writer, but has what I believe is fundamentally a better premise. I hope it's not just prejudice that makes me rate his the better book.

THE LANGUAGES OF PAO, by Jack Vance. Avalon Books, New York. 1958. 223 pp. $2.75

In this novel from the December, 1957 *Satellite* Jack Vance is having a good time with a fascinating concept, and letting the game get in the way of his usual story-weaving ability, which reached its peak in "Big Plant" of this same Avalon series.

In the planet Pao we presumably have a world of the very far future, one of many colonized from Earth but now having distinct physical types and languages of their own. Pao has a stagnant sort of culture, relatively undisturbed by occasional assassinations in the ruling circle, and one peculiar world-language.

The scientists of the neighboring world of Breakness launch a ruthless experiment, jarring Pao into new virility by installing three class-languages, one for a warrior class, one for technicians, one for rulers or ruler/bureaucrats. But they build into the formula the weaknesses of their own old, stable, degenerate culture based on controlled breeding of captive women, modification of the human body to make it a near-robot, and other useful niceties.

Beran Panasper, eight-year-old heir to the throne of Pao, has been spirited away to Breakness to save his life—and to enable the "Breakness Wizard," Palafox, to train a tool for the later subjugation of Pao. But Beran's Paonian characteristics blend with Breakness science in an unsuspected way.

A very good yarn that should have been even better.

FLYING SAUCERS AND THE STRAIGHT-LINE MYSTERY, by Aimé Michel. Criterion Books, New York. 1958. 285 pp. $4.50

This book had been out for some time before a copy came to me, and I suspect I got it through the good graces of Civilian Saucer Intelligence of New York, one of whose officers had complained that I don't distinguish between serious and crackpot books on UFO's. The CSI Research Division has translated and edited the French text and the result is the sanest and most "serious" UFO book that I have seen, though it compounds the Saucer puzzle rather than clarifies it.

Michel, apparently, is a scientist. He is writing about a swarm of French sightings and landings of UFO's of several types, primarily cloudy cigar-shapes and glowing disks, with or without trailing streamers like the tentacles of a jellyfish, during the fall of 1954. For many of these he gives us precisely the eyewitness accounts that I asked for in this department, a few months ago—in the witnesses' own words. Granted that these direct quotations may have been consciously or unconsciously edited by the newspaper reporters and UFO researchers who interviewed the men, women and children in question: they are still quotes—not paraphrases by the editor—and they sound like the statements of different people.

It may be writing skill, but these reports have a much more plausible sound to them than most American sighting statements, and the very numerous "little men" who appear in them *sound* like intelligent creatures in spacesuits, trying to communicate with other intelligent beings on a strange planet. They have nothing at all in common with the English speaking or telepathic do-gooders from Mars, Venus, and the world-behind-the-Moon reported by Adamski, Bethurum and others.

But what makes this book so impressive is the "straight-line mystery" that developed when Michel and his associates plotted the sightings of any one day on a map of France. Most of the reports were from cities and villages that could be connected by straight lines ruled across the map for hundreds of miles.

Now, this is precisely the technique that anti-Saucer critics use to trace the course of a meteor or a drifting weather balloon, and scientists can certainly not object to its use. At first sight, you might consider that the spots along the line are successive positions of one Saucer, streaking across the landscape—but the independently reported sightings which generate such a nice geographical sequence do not always give a temporal sequence. UFO's may appear almost simultaneously at opposite ends of a line, hundreds of miles apart, or be seen in the morning at one town and in the afternoon at its neighbor. Moreover, on some days —notably October 2nd and 7th— the whole groups of lines intersected at one point, a kind of "radiant"

which the author interprets as the location of a "mother ship" or rallying point, from which exploring craft were going and coming along something like linear homing beams.

Whatever UFO's—these UFO's, little men and all—may be, this is not the behavior you expect of natural phenomena. Michel and his fellow investigators have named the pattern-forming characteristic of UFO appearances "orthoteny," from the Greek word meaning "stretched in a straight line," and it deserves to settle into the language, English as well as French. Also, by way of demonstrating that they are by no means a set of starry-eyed occultists communing with Great Spirits from the Stars, the CFI researchers have produced some nice alignments of their own by sprinkling catnip seeds on a map of the United States.

Is there an innate difference between catnip seeds on a map of Pennsylvania and Saucer sightings, complete with little men in turnip fields, on the map of France? I think there is, and on the evidence, people like Aimé Michel and the CFI are the ones who will find it out.

Endless descriptions of vague visions in the clouds get pretty tedious after a while, but so, I suppose, do descriptions of the numbers and shapes of arrowheads found here and there, in the archeological papers I read for scientific enjoyment and information. Decide what you will, this *is* a serious Saucer book by a man who knows something about science and evidence. It won't solve anything, but—unless it's made up out of whole cloth—it certainly proves there's something to be solved.

THE COSMIC RAPE, by Theodore Sturgeon. Dell Pubilshing Co., New York. No. B-120. 1958. 160 pp. 35¢

I suspect the publisher of doctoring up the title of this story, which was "To Marry Medusa" in *Galaxy* last year, in the hope of trapping some sex-novel readers. If they bought for the title, I'm sure there is no more bewildered lot in the country today because the theme is pure SF and the treatment is pure Sturgeon.

Here he is at the group-mind concept again, which he brought to a high in "Baby Is Three" and the expanded "More Than Human." The Medusa, a seedlike invader from space who belongs to a mass-mind species, implants himself—or itself—in the body of the first human being it encounters, the moronic Gurlick. In all the eons of this race's galactic history, this should have been enough to place the Medusa race in full control of all humanity—but to its uncomprehending amazement, men are discreet, individual units and there is no mental web for it to invade.

Meanwhile, Sturgeon is also telling scraps of the stories of disturbed individuals scattered over the face of the Earth, all of them just a little

different from the run of humanity, all of them misfits like Gurlick, though not his moronic type. And when the Medusae at last discover that they must use mechanical tools to absorb mankind, these odd-balls and others like them spring to the defense of the race that excludes them.

You can argue for hours about what Sturgeon is trying to say about mass minds in this story, and maybe some of the more serious SF groups will. The technique is rougher than in some of the author's earlier stories, and gets in the way of the narrative. Even so, any Sturgeon book is an experience and this is no exception.

THE FITZROY JULES VERNE
Associated Booksellers, Westport, Conn. Available through Gnome Press, P.O. Box 63, Hicksville, N. Y. $3.00 each.

FIVE WEEKS IN A BALLOON (253 pp.)
THE BEGUM'S FORTUNE (191 pp.)
A FLOATING CITY (189 pp.)

These three introductory volumes in the new English edition of Jules Verne—which do not seem to be new translations, as I had supposed, but which do have good introductions by the editor, I. O. Evans—illustrate three facets of their author's career as a popular writer. "Five Weeks in a Balloon" is the first, and still one of the best and best-known, of his "Voyages Extraordinaires." "The Begum's Fortune" is a kind of science fiction—the utopian novel, set a very little way ahead of his own time. "A Floating City" is practically a travel book, based on Verne's own trip to America on the gigantic jinxed steamboat, *The Great Eastern*.

To the unknown first if, like me, you've never seen "The Begum's Fortune" before. A French scientist, expert in public sanitation, and a Prussian munitions manufacturer are heirs to a twenty-one-million-pound legacy—big money in 1871. They found rival cities in the American west: the French Frankville, in northern California, a sanitary utopia of science; the German Stahlstadt, just over the Oregon border, a walled, compartmented, completely totalitarian metropolis of technology —military technology.

A young Alsatian protegee of Dr. Sarrasin, the French savant, penetrates to the heart of Stahlstadt by making himself useful to the villainous Professor Schultz. He finds the German's laboratory-tower a marvel of technology, in the best Vernian vein—and among the marvels a giant cannon, with which Schultz proposes to blast Frankville out of existence. Actually, the thing is a kind of step-rocket, with the cannon as a booster —and before the story is over, young Max (or rather, the Professor's miscalculations) has converted the projectile into a satellite of the Earth!

Verne's grim picture of the "Steel City" of Stahlstadt would not be out of place in a present-day SF yarn

about a future world-state such as Herr Schultz hoped to establish. He has developed its details with relish. Frankville, the "true" utopia of French culture, is rather insipid by contrast. The villain always has the most fun!

There is no villain in "Five Weeks in a Balloon," Verne's first novel. Three explorers, including one of Verne's typical faithful but comic servants, set out to drift across Africa from east to west in a balloon, hoping to discover the source of the Nile. They are attacked by baboons and cannibals, rescue a missionary, are towed by an elephant, are dive-bombed by gyrfalcons, are becalmed in a waterless desert, lose the self-sacrificing Joe, discover a fortune in raw gold . . .

Personally, I consider the book SF of its period. It extrapolates guesses as to the geography of interior Africa. It controls the altitude of the balloon with an ingenious device that, as far as I know, has never been tried in practice but just might work, heating and cooling the hydrogen to make the gas bag rise or fall. It could be made into another lively Victorian movie like "Around the World in Eighty Days"—but as unlike as possible, I trust, the abortion perpetrated on "From the Earth to the Moon"!

The third book, "A Floating City," is practically a straight travelogue, enlivened by one of Verne's best characters and made slightly ridiculous by a plot that belongs in soap opera and was therefore ahead of its time. *The Great Eastern,* the colossal steamer which laid the Atlantic cable, was about as unlucky a ship as has ever floated, and the usual catastrophes occurred on Verne's own voyage. For good measure we have the delightful Dean Pitferge, a jolly little man who collects such mishaps and cruises back and forth on the ill-fated ship in order to predict and enjoy them. As a bonus, we get a brief jaunt up the Hudson and across New York State to Niagara Falls.

As for the plot, it is right out of afternoon TV or radio. Will the dashing Captain MacElwin regain his lost sweetheart? Is the madwoman in black the fair Ellen? Will her husband, the villainous international gambler Drake, force MacElwin into a duel and cut him down? If the captain kills the gambler, how can he ever marry the widow of the man he has slain? Will Ellen ever regain her sanity?

Silly? So is its present-day counterpart. So forget the romance and enjoy this transatlantic voyage in one of the most preposterous ships that ever floated.

Then, for good measure, look up the factual account of what *The Great Eastern* accomplished as a cable-laying ship, in Arthur C. Clarke's new book, "Voice Across the Sea" (Harper & Brothers, N. Y. 1958. 208 pp. $3.75). It's an excellent account of the laying of the Atlantic Cable and some of its successors, and—in the last third of the book—the story of the struggle to get down a workable transatlantic *telephone* cable. As you'd expect

from the author's way with facts, it is full of interesting sidelights on the people and problems. Among the incidental intelligence is the fact that Oliver Heaviside—who realized why radio waves are able to circle the Earth by rebounding from the ionosphere (as we now call it)—also, in passing, hit on the mass-energy equation well before Einstein.

PARAPSYCHOLOGY: FRONTIER SCIENCE OF THE MIND, by J. B. Rhine, and J. G. Pratt. Charles C. Thomas, Springfield, Illinois. 1957. 220 pp. $4.75.

This summary of the *psi* field seems almost to have been sneaked into print through a small publisher, and to have had practically no reviews in the scientific journals. I found it in the bibliography of the Schmeidler-McConnell book on ESP and personality and promptly sent for it; it was not so prompt in arriving, so here it is two years late. It is still the only recent book I know that sums up the Duke University parapsychologists' ideas of what they have found out, and explains what kind of experiments they have been doing.

For what it tries to do, it is a maddeningly conservative book and a maddeningly clumsy one. I am not quite sure who the readers are supposed to be, though the jacket speaks of "students in colleges." It is dogmatic where it ought to be persuasive, and assumes too much knowledge on the part of its readers. Instead of taking a litle space to summarize some of the key experiments, it refers you to documentation in the *Journal of Parapsychology,* which you will find in few but the most specialized libraries. When it does refer to what appears to be a classic experiment, it merely says the results were "highly significant" without offering any numerical or statistical statement of what those results were. That is what I mean by dogmatism.

What do you get? To go at it backward, the last third of the book is a manual of testing procedures and statistical techniques of evaluation. The reader who is trying to find out what there "is to" ESP and *psi* needs some of this information much earlier, to assure him that the standard tests are designed to be free of fraud and unconscious clues. It is an indication of the exasperating way the authors have thrown away good chances to "sell" their field, that the only mention of picture-matching tests—much more impressive to a layman than card-guessing—is a short section on scoring such tests.

Continuing backward, the four chapters preceding the "how to" section are the most interesting part of the book. Here—although far too generally—the authors do sum up their present impressions of what we know about *psi* functions, and their relationships to other fields of science.

The first two chapters are flat, theoretical matter which could have been brought to life with suitable examples from the "Testing Techniques" section.

I hoped this would be a book that could be recommended to skeptics, as *the* definite word on the subject, direct from the men who created the field in this country. It isn't that at all, and I suppose the reason is that the book is meant as a text, and an old-fashioned one at that. The student/reader is *told* but not shown that certain things have been done, and certain results obtained, but the evidence is down in the library or up in the lab, where he will reproduce it himself when he gets to the part of the course on techniques.

I'm afraid that for a book that will convince the skeptics, we'll have to wait for one of the English practitioners.

THE BULL OF MINOS, by Leonard Cottrell. Rinehart & Co., New York. 1958. 234 pp. $4.50.

I'm telling you about this—and about books like it, from time to time—on the chance that the "lost civilization" theme hasn't completely died out of science fiction, and that some of you are mildly interested in civilizations that are being found in the bogs and potholes of prehistory.

This book appeared in England five years ago, and has been brought up to date in a way that I'll explain shortly. It's the best of Cottrell's books that I have read. He is telling the story of the long lost civilization of ancient Crete—legendary home of King Minos, the Minotaur, the Labyrinth, Daedalus and Icarus—and how two men rediscovered it in our time.

Cottrell has interwoven his elements especially skilfully in this book. They are the lives and anecdotal accounts of the discoveries of the two archeologists, Heinrich Schliemann and Sir Arthur Evans . . . the picture of Mycenean and Minoan times that has been put together through their work and that of others who followed their lead . . . and the authors' own visit to the ruins of this lost sea-empire.

The Cretans were a dominating force in the Mediterranean some thirty-five hundred to four thousand years ago. They are depicted and described in the contemporary Egyptian records. They were remembered in Greek tradition. They may have supervised the building of part of Stonehenge in England, where their trading ships went for tin. They kept fairly voluminous business records in three successive scripts—heiroglyphics quite unlike any others, and two cursive scripts, "A" and "B" in order of antiquity, scribbled in wet clay with a pointed bone. Yet nobody knows who they were or where they came from, and nobody knows what their language was or how to read it. It is only in the last few years that we have known that the third and latest script, "Linear B," isn't Minoan at all but an antique form of Greek that was used by the rulers of Mycenae and the other mainland strongholds from which the onslaught against Troy set out.

Cottrell does suggest an untried

homeland for the Minoans, that was new to me: Libya, another empty hole in the map of antiquity, where archeological work has been practically limited to the late Greek colonies, although Libyans were strong and active enemies of a powerful Egypt in ancient times.

All this adds up to one of the great archeological accomplishments of our times, and to round the story out, and get an idea of what linguists must go through if they find inscriptions in an unknown script and an unknown tongue when we land on Mars, try John Chadwick's "The Decipherment of Linear B" (Cambridge University Press; 1958; 147 pp; $3.75). This story, which Cottrell has sketched into the new edition of his book, belongs to the saga of the gentlemen scientists, for Michael Ventris, the man who "broke" the Minoan code, was no archeologist but a young English architect. Fortunately he was gifted in languages, having taught himself Egyptian heiroglyphics from a German manual at the age of seven. Fortunately, too, he had the co-operation of specialists like Chadwick, and of archeologists who gave him access to unpublished Mycenean tablets with which to extend and test his work.

Ventris died in an auto accident before he was well started. Chadwick and others are carrying on the work, and this book makes quite clear how they have worked and what they have teased out of some peculiar squiggles on slabs of dried mud. It also makes clear how uncertain this whole question of reconstructing a forgotten civilization can be, for *if* the tablets hadn't been baked in the fire that destroyed the palaces where they were stored, and *if* the language hadn't been Greek, and *if* there hadn't been drawings to supplement some of the words . . . well, we still can't read Linear A, or the Cretan heiroglyphs.

SECOND TIME 'ROUND

THE THIRD LEVEL, by Jack Finney. Dell Books No. D-274. 1959. 192 pp. 35¢

Reprint of the twelve story collection of good to very good SF and fantasies, mostly from the big, slick magazines.

OFF THE BEATEN ORBIT, edited by Judith Merril. Pyramid Books No. G-397. 1959. 192 pp. 35¢

A paper-back reprint of the paperback original known as "Galaxy of Ghouls." Mainly fantasy, and very good, as what Merril anthology isn't.

DOOMSDAY MORNING, by C. L. Moore. Avon Books No. T-297. 1959. 221 pp. 35¢.

Third real winner in a wonderful month for reprints. "Comus"—Communications U. S.—rules the world, but Howard Rohan fights back.

AWAY AND BEYOND, by A. E. van Vogt. Berkley Books No. G-215. 1959. 172 pp. 35¢

Six of the seven stories in this edition were first published here between 1942 and 1946. There were two more in the 1952 hard-bound edition.

THE MIDWICH CUCKOOS, by John Wyndham. Ballantine Books No. 299K. 1959. 189 pp. 35¢

The original United States edition was not only one of the top SF novels of 1957, but—I think—the last Ballantine SF title to come out in hard covers. If you felt you had to wait, don't delay any longer.

THE DEMOLISHED MAN, by Alfred Bester. Signet Books, No. S-1593. 1959. 175 pp. 35¢

A re-reprint of the classic novel that nobody should miss. The original Signet paperback edition came out in 1954.

THE SEEDLING STARS, by James Blish. Signet Books, No. S-1622. 1959. 158 pp. 35¢

If the Universe isn't suited to Man, we'll remake Man to suit the Universe. Here's how it will be done.

THE DEEP RANGE, by Arthur C. Clarke. Signet Books, No. S-1593. 1958. 175 pp. 35¢

Another of Clarke's inimitable documentaries-with-action: an executive's problems in the day when we have to farm the seas and compete for plankton with the whales we milk.

THE FOREVER MACHINE, by Mark Clifton and Frank Riley. Galaxy Novels, No. 35. 1958. 159 pp. 35¢

The new title conceals the novel about Bossy, the super-computer, and the people she gave immortality, which was published here and by Gnome as "They'd Rather Be Right."

TIME TO COME, edited by August Derleth. Berkley Books, No. G-489. 1958. 172 pp. 35¢

Ten of the twelve not-very-outstanding stories in the 1954 hard-bound anthology.

SOLAR LOTTERY, by Philip K. Dick. Ace Books, No. D-340. 1959. 188 pp. 35¢

RING AROUND THE SUN, by Clifford D. Simak. Ace Books, No. D-339. 1958. 190 pp. 35¢

Reissues of the paperback editions of two excellent novels, Simak's originally a hardback in 1952, Dick's a pb original with Ace in 1955.

THE END

(*Continued from page 7*)

But real life is a bit more like chess-as-it's-played than like computer-chess; in official chess, there's a time limit on moves. In competition chess, you can lose the game just as certainly by taking too much time for your moves, as by making a false move. And . . . real-world affairs are that way. If a man starts to attack a problem with scientific exactitude, and with scientific thoroughness works on it for fifteen years, finally announcing his result only when he has made absolutely certain that it is the one sure, inevitable and necessary result . . . he may find that some engineer with a brilliant heuristic approach simply shifted a decimal point fourteen years ago, got the right answer, developed it commercially, and it's now obsolete.

Given time enough—and the unlimited patience of a machine — a computer could play each possible move all the way to all possible future consequences. In this case, "time enough" happens to mean several quintillions of years, of course, but to the theoretical logical-mathematician, 10^{10000} is *not* infinite.

To the engineer, it is.

Our modern civilization is based on the use of steel tools; the immediately preceding stage was based on the use of bronze and other softer metal tools.

The first scientific comprehension of iron as a chemical entity came centuries after heuristic iron-masters had developed iron-age weapons that made possible a level of civilization that could support algorithmic thinkers.

But this distinction between algorithmic and heuristic methods cuts two ways; you can develop a darned sight more efficient heuristic techniques once somebody's figured out algorithmic frameworks.

Shannon and his group at M.I.T. are not interested in consuming hundreds of hours of precious computer time playing chess; the too-few computers are too badly needed for more important problems. But . . . chess represents a perfectly logical system in which heuristic techniques always have, and always will dominate; perfectly logical it may be, but it's also perfectly impossible to play chess logically! It constitutes a fully-defined system in which it is positively known that logic works perfectly, and infallibly . . . theoretically. And at the same time, it is a system in which, although it is perfectly logical, *non-logical methods must be used.* Heuristic short cuts that cannot be defended as complete, or even certain, must be employed—and the one who most *wisely*—not most *logically*—selects his heuristics will win.

If a computer were programed to play chess algorithmically, it could study all possible moves two, three, and possibly four moves in advance. A human chess player would then need only to discover this limitation . . . and the machine would be a sucker for any five-move trap. No matter how blantantly obvious the trap would be—the machine, being tied to exploring all moves for four,

and only four, moves ahead, couldn't possibly detect it. A human player neither explores *all* possible moves four moves ahead, nor does he explore *only* four moves ahead. A machine that explores all moves two moves ahead would fall for the dearly-beloved of the beginning chess player, Fool's Mate. That takes three moves; the machine couldn't see it coming. (Actually, the machine would "foresee" it when it was two moves away, of course.)

In studying such problems, Shannon's group is, in effect, studying how to use logical machines most efficiently—on any logical problem, including logical problems that are characterized by exponentially increasing complexity as they develop.

In other words, the problem is, "What nonlogical programing system can shift the logical machine's attention from logical-but-irrelevant areas to the logical-and-relevant problems that need solving?"

In essence, this is the problem of a research director; every scientific investigation uncovers unending hierarchies of problems that *can* be pursued scientifically. (And usually the researcher who's uncovered one is strongly convinced that it should be explored. Logically, under the scientific method, his position is perfectly defensible. He has found a certain problem exists, that it can be explored, and represents, therefore, a known area of uncertainty in the certainty fabric of human Science.)

The laboratory research director's problem is to find a way of deciding which problems are not only explorable, but worth exploration . . . in heuristic terms! The individual scientist must, not infrequently, be hauled back, almost bodily, from exploration of some fascinating-to-him byway of esoterica, and reinstalled on some more productive path.

Shannon's problem is, "How can the logically persistent computer be induced to stop exploring knight moves, when any human player can see from the first exploration that no knight move can be advantageous?"

The research director's problem is "How can the scientifically persistent researcher be induced to stop explor-

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ing his byway, when no adequate reward can come from it within the available time-and-effort budget?"

Naturally enough, every scientist wants to be a "pure scientist" in the sense of exploring the particular path he has found fascinating, personally exciting, whether there be any reward in terms of anything other than his own satisfaction or not. That is, it's human to want to do what you want to do because it pleases you to do it. If you carry out that human desire using the scientific method, you are a "pure scientist"—a "science-for-its-own-sake scientist."

Only . . . can we be a bit more honest, and recognize it as being a "science-because-it-satisfies-me scientist"?

There is a type of "pure scientist" who seems to regard Science as something Holy, the Source of the Light of Truth, or something, and that, therefore, somebody should support *him* because *he* likes scientific research.

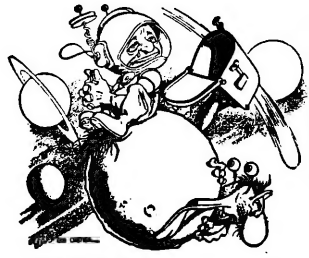
Now it's one thing to have a hobby that, more or less coincidentally, someone else wants, and something quite different to have a hobby that you want, and insist that others *should* want it whether they do or not, and *should* be made to pay for it.

This, too, sadly is the research director's problem. What of the researcher who insists that the company —or government or university— *should* support his work because it is Search for Truth.

Perhaps it's also proper to ask "Is this Truth necessary?" The computer figuring out knight moves is determining unarguable Truths; the conclusions it reaches are unshakably valid. But . . . is that Truth necessary?

The opposite factor, of course, is the all-too-common attitude that better cosmetics, shinier chrome plate, and softer upholstery is the Proper End and Goal of Science—that *that's* what Science really is, and all the nonsense of measuring the neutron absorption cross section for zirconium is what causes all our troubles and it oughtta be stopped.

Ultimate refinement is one of the goals of Science . . . but it can be carried too far, it can be too purely logical, like the computer. American



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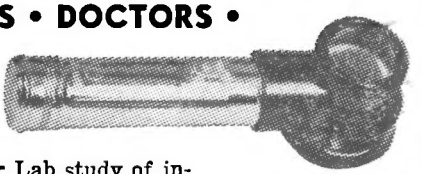

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Science pulled a Grade A boner by losing the game through taking too long to think out its moves; the Russians have long been the world's master chess players. They proved better players of the rocket game, too. While American Science was refining, perfecting, "sophisticating" and miniaturizing to produce the super-de signed Vanguard . . . Russia settled for some heuristic techniques. Imperfect—not fully defensible—but they forced the time-limit.

As a matter of fact, American Science didn't meet its own time-limit. IGY was over before the first full-scale Vanguard got into orbit.

That America badly needs a major development of fundamental research is true, and crucially important. But we do *not* need the "pure science" type of research. "Pure" science is not by any means in one-to-one correlation with *fundamental* research; it just feels that way to the human being who is a scientist and wants to do what he likes to do.

What we need, I think, is a bit more appreciation of the importance of heuristics—some new method of using nonlogical jumps, to get the power of logical analysis into areas that need analysis.

Truth is a wonderful thing, no doubt, and the Search for Truth an important thing.

But I keep thinking of that computer busily searching out the truth of the consequences of all those knight moves . . . while the game is lost.

THE EDITOR.

THE END

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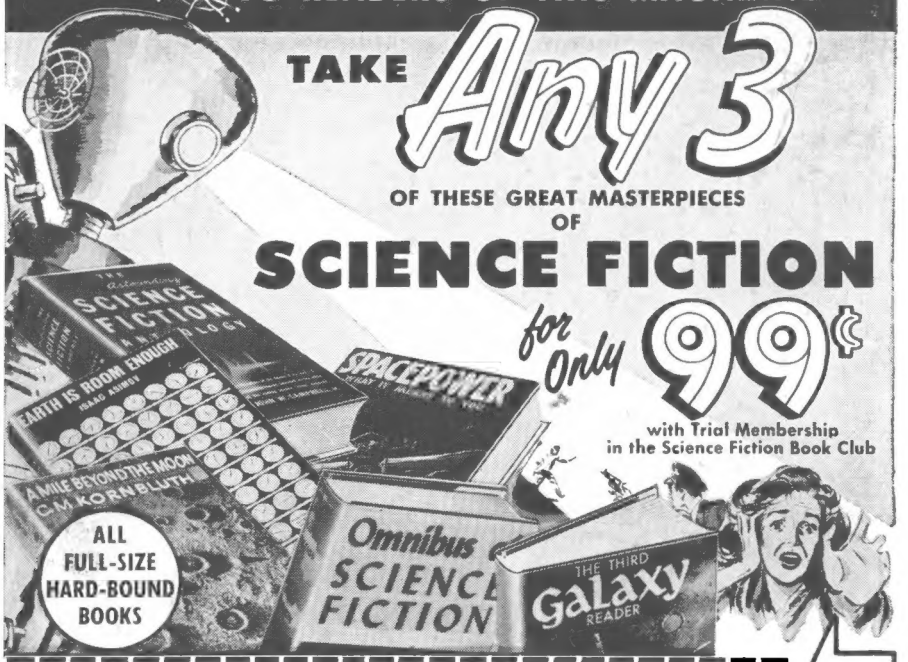

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